Analysis of Unicorn Startups

Contents

1 Introduction

- **What is a Unicorn Startup?**

  In business, a unicorn is a startup company valued at over US$1 billion which is privately owned and not listed on a share market.

2 Setup

2.1 Import Packages

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from matplotlib.ticker import FuncFormatter
import seaborn as sns
```

2.2 Theming

```
sns.set_theme(palette='husl')
```

3 Data Preparation

3.1 Load Data

```
pd.set_option('display.max_columns', 50, 'display.width', 200)
df = pd.read_csv('input/datasets/Unicorns_Completed (2024).csv')
df_wiki = pd.read_csv('input/raw_data/list-of-unicorn-startups_20250619 (wikipedia).csv')
```

3.2 Data Cleaning

```
import re
def convert_years_months(s):
    m = re.match(r'(\d+)y?\s?(\d+)m?o?', s)
    return f'{m[1]}y{m[2]}m' if m else s

df['Years to Unicorn'] = df['Years to Unicorn'].apply(convert_years_months)

def correct_industry_labels(s):
    if s == 'Health':
        return 'Healthcare & Life Sciences'
    if s == 'West Palm Beach':
        return 'Enterprise Tech'
    return s

df['Industry'] = df['Industry'].apply(correct_industry_labels)

def correct_company_names(s):
    if s == 'Scale':
        return 'Scale AI'
    return s

df['Company'] = df['Company'].apply(correct_company_names)
```

3.3 Prepare Data

3.3.1 Column Types

```
df['Unicorn Date'] = pd.to_datetime(df['Unicorn Date'])
df['Valuation ($B)'] = pd.to_numeric(df['Valuation ($B)'])
df['Unicorn Year'] = df['Unicorn Date'].dt.year
df['Funding ($B)'] = df['Total Equity Funding ($)'] / 1e9
df['Funding ($M)'] = df['Total Equity Funding ($)'] / 1e6
```

```
df['Investors'] = df['Select Investors'].str.split(', ')
```

3.3.2 Merge datasets (Latest Valuations and Founders)

```
df_wiki.rename(columns={'Valuation (US$ billions)': 'Latest Valuation ($B)'}, inplace=True)
df_wiki = df_wiki.drop_duplicates('Company')
df_wiki['Company'] = df_wiki['Company'].str.strip()
df_wiki['Founder(s)'] = df_wiki['Founder(s)'].str.replace(' and ', ', ').str.split(', ')
df = df.merge(df_wiki[['Company', 'Latest Valuation ($B)', 'Founder(s)']], on='Company',
↪  how='left')
df['Latest Valuation ($B)'] = pd.to_numeric(df['Latest Valuation
↪  ($B)'].fillna(value=df['Valuation ($B)']))
```

3.4 Preview

```
print(df.info())
print(df.describe())
print(df.head())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1244 entries, 0 to 1243
Data columns (total 16 columns):
 #   Column                    Non-Null Count  Dtype
---  ------                    --------------  -----
 0   Company                   1244 non-null   object
 1   Valuation ($B)            1244 non-null   float64
 2   Total Equity Funding ($)  1244 non-null   int64
 3   Unicorn Date              1244 non-null   datetime64[ns]
 4   Date Founded              1244 non-null   int64
 5   Years to Unicorn          1244 non-null   object
 6   Industry                  1244 non-null   object
 7   Country                   1244 non-null   object
 8   City                      1244 non-null   object
 9   Select Investors          1244 non-null   object
 10  Unicorn Year              1244 non-null   int32
 11  Funding ($B)              1244 non-null   float64
 12  Funding ($M)              1244 non-null   float64
 13  Investors                 1244 non-null   object
 14  Latest Valuation ($B)     1244 non-null   float64
 15  Founder(s)                130 non-null    object
dtypes: datetime64[ns](1), float64(4), int32(1), int64(2), object(8)
memory usage: 150.8+ KB
None
```

```
       Valuation ($B)  Total Equity Funding ($)                    Unicorn Date  Date Fou
count     1244.000000              1.244000e+03                            1244   1244.00
mean         3.626487              5.985096e+08  2021-02-10 22:05:24.115755776   2013.37
min          1.000000              0.000000e+00             2007-07-02 00:00:00   1919.00
25%          1.100000              2.170000e+08             2020-08-13 12:00:00   2011.00
50%          1.550000              3.525000e+08             2021-07-21 00:00:00   2014.00
75%          3.000000              6.090000e+08             2022-02-24 00:00:00   2017.00
max        350.000000              1.900000e+10             2024-12-24 00:00:00   2024.00
std         15.016365              1.222045e+09                             NaN      5.51
     Company  Valuation ($B)  Total Equity Funding ($) Unicorn Date  Date Founded Years
0     SpaceX           350.0                9000000000   2012-12-01          2002
1  ByteDance           300.0                8000000000   2017-04-07          2011
2     OpenAI           157.0               18000000000   2019-07-22          2015
3  Ant Group           150.0               19000000000   2017-01-01          2014
4     Stripe            70.0                9000000000   2014-01-23          2009

                                  Select Investors  Unicorn Year  Funding ($B)  Fundi
0         Opus Capital, RRE Ventures, Relay Ventures          2012           9.0
1          Breyer Capital, Parkway VC, TIME Ventures          2017           8.0
2            Dynamo VC, Susa Ventures, Founders Fund          2019          18.0
3  Alibaba Group, CPP Investments, The Carlyle Group          2017          19.0
4       Sequoia Capital China, ZhenFund, K2 Ventures          2014           9.0

                                  Founder(s)
0                                [Elon Musk]
1                   [Zhang Yiming, Liang Rubo]
2  [Sam Altman, Greg Brockman, Ilya Sutskever]
3                                        NaN
4                    [Patrick, John Collison]
```

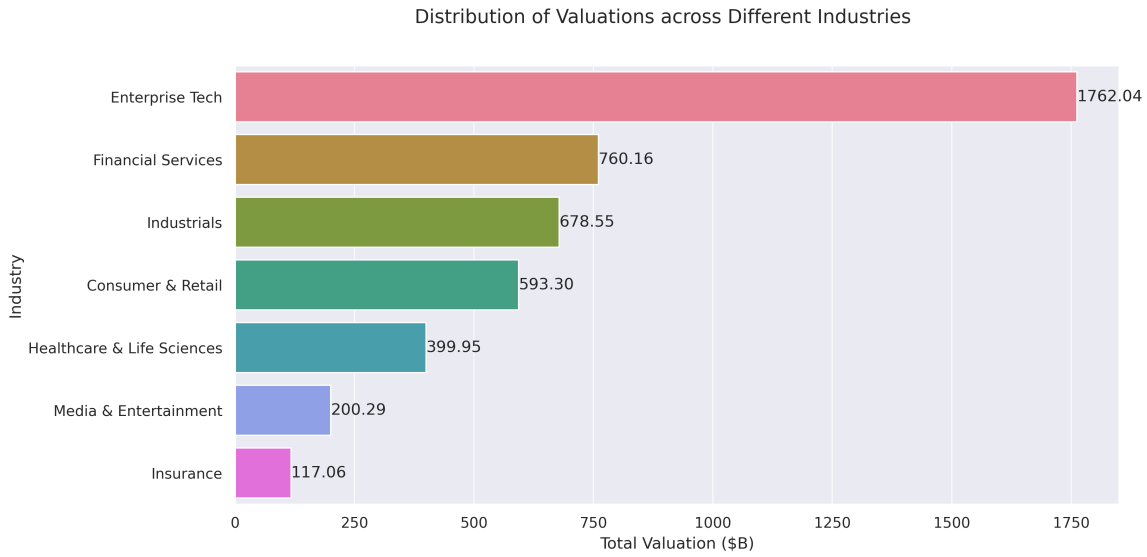
4 Descriptive Analysis

4.1 Distribution

4.1.1 Valuations

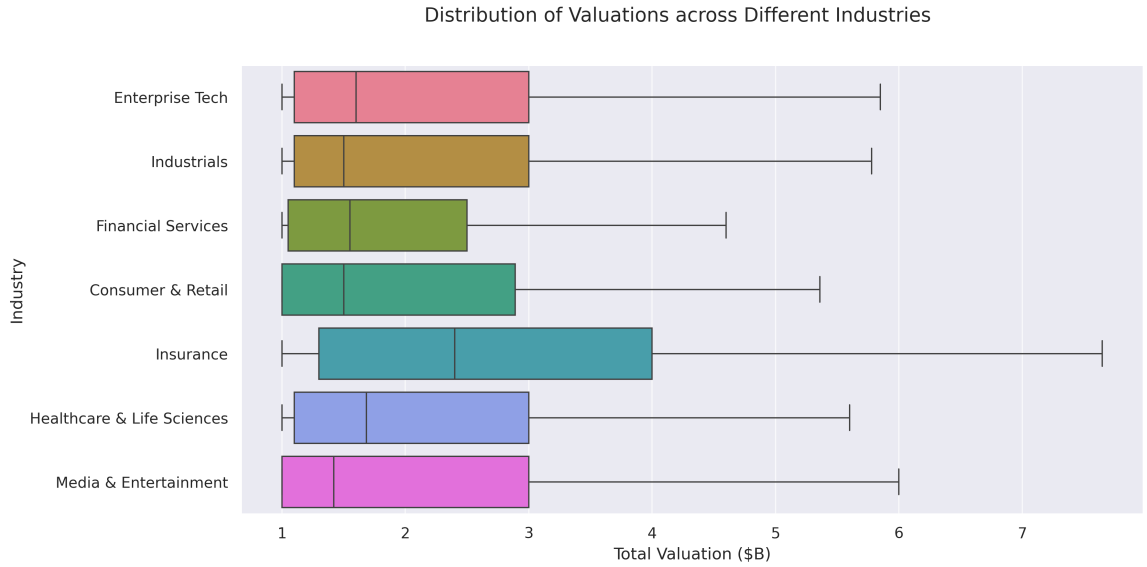
Distribution of Valuations across Different Industries

```
industry_valuation_df = df.groupby('Industry')['Valuation
↪  ($B)'].sum().reset_index().sort_values('Valuation ($B)', ascending=False)
industry_valuation_df
```



Mean Distribution of Valuations across Different Industries

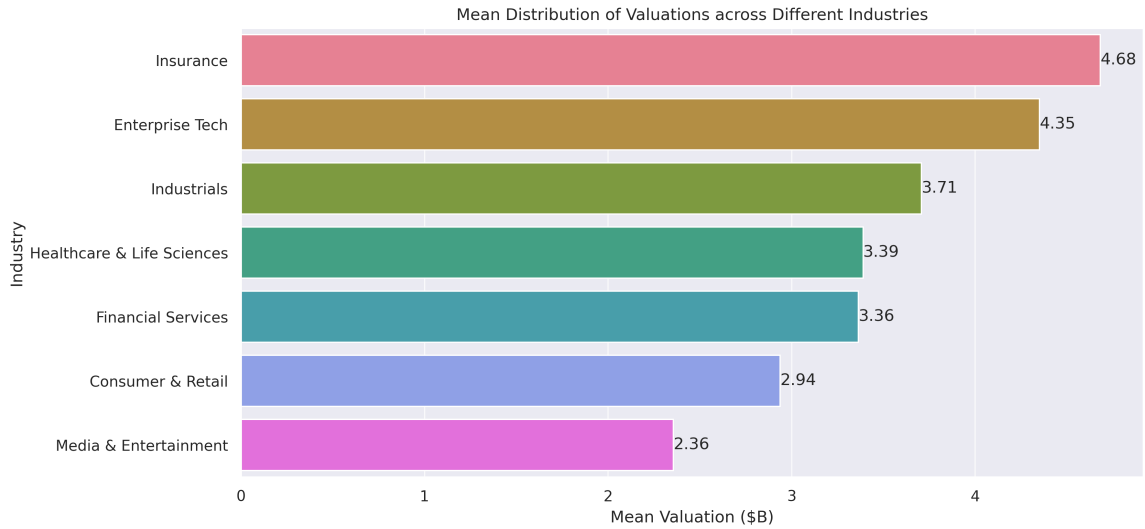
```
fig, ax = plt.subplots(figsize=(12, 6), dpi=300)
sns.boxplot(df, y='Industry', x='Valuation ($B)', hue='Industry', showfliers=False)
plt.suptitle('Distribution of Valuations across Different Industries')
ax.set(xlabel='Total Valuation ($B)',
       ylabel='Industry')
plt.grid(axis='x', alpha=0.7)
plt.show()
```




```
industry_valuation_df = df.groupby('Industry')['Valuation
↪  ($B)'].mean().reset_index().sort_values('Valuation ($B)', ascending=False)
industry_valuation_df
```

```
plt.figure(figsize=(12, 6),dpi=300)
```

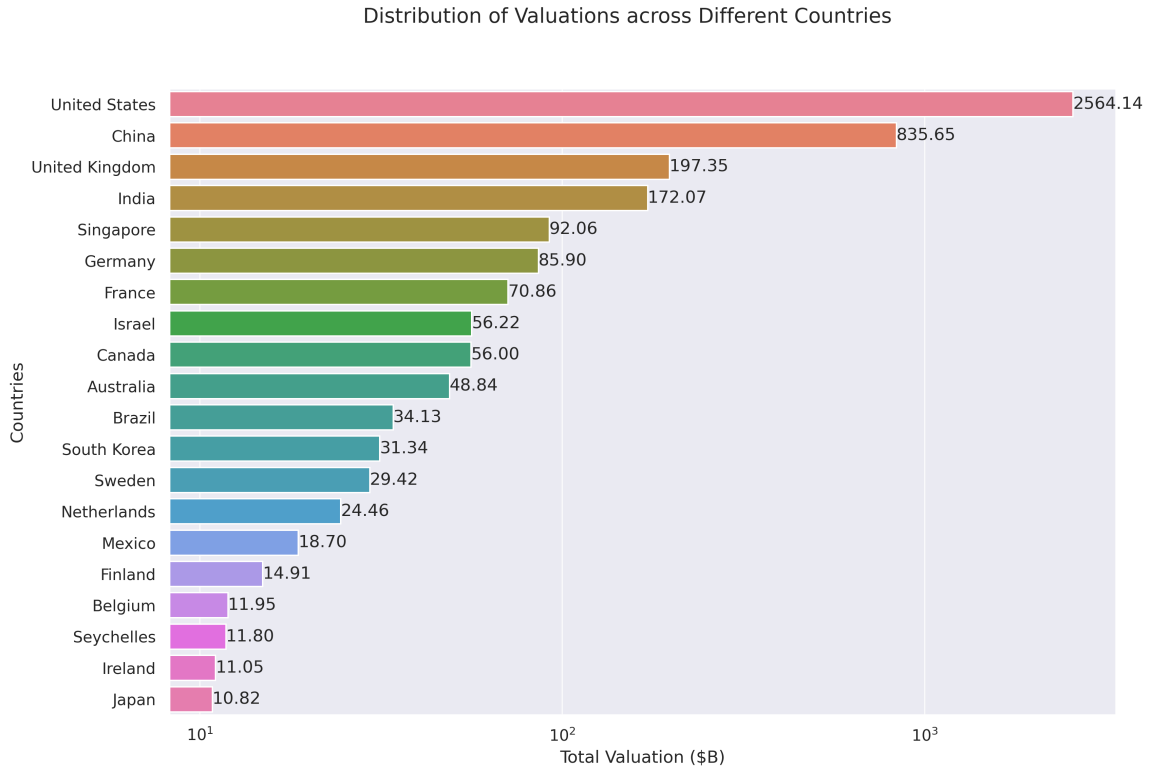
```
ax = sns.barplot(industry_valuation_df,
                 y='Industry',
                 x='Valuation ($B)',
                 hue='Industry')
for i in ax.containers:
    ax.bar_label(i, fmt='%.2f')
plt.title('Mean Distribution of Valuations across Different Industries')
plt.xlabel('Mean Valuation ($B)')
plt.ylabel('Industry')
plt.grid(axis='x', alpha=0.75)
```



Distribution of Valuations across Different Countries

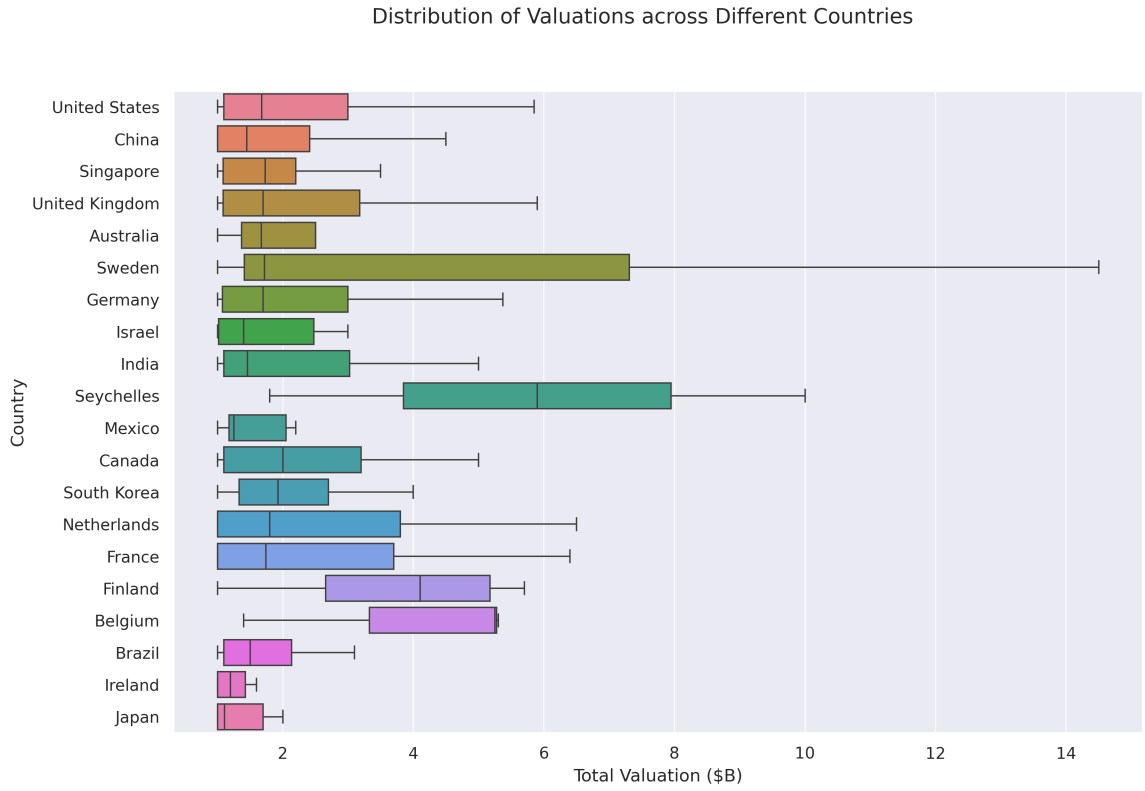
```
country_valuation_df = df.groupby('Country')['Valuation
↪  ($B)'].sum().reset_index().sort_values('Valuation ($B)', ascending=False).head(20)
country_valuation_df
```

```
plt.subplots(figsize=(12, 8), dpi=300)
ax = sns.barplot(country_valuation_df,
                 y='Country',
                 x='Valuation ($B)',
                 hue='Country')
for i in ax.containers:
    ax.bar_label(i, fmt='%.2f')
plt.suptitle('Distribution of Valuations across Different Countries')
plt.xlabel('Total Valuation ($B)')
plt.ylabel('Countries')
plt.grid(axis='x', alpha=0.75)
plt.xscale('log')
plt.show()
```



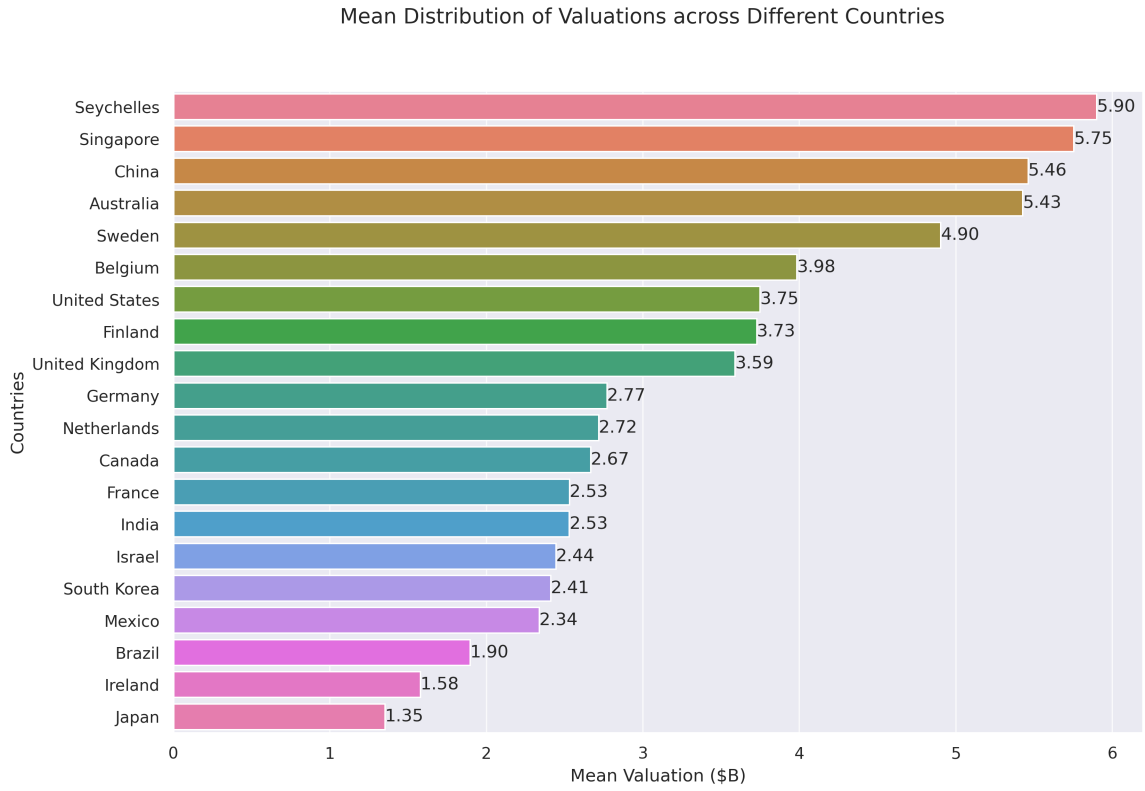
Mean Distribution of Valuations across Different Countries

```
fig, ax = plt.subplots(figsize=(12, 8), dpi=300)
sns.boxplot(df[df['Country'].isin(country_valuation_df['Country'])],
            y='Country',
            x='Valuation ($B)',
            hue='Country',
            showfliers=False)
plt.suptitle('Distribution of Valuations across Different Countries')
ax.set(xlabel='Total Valuation ($B)',
       ylabel='Country')
plt.grid(axis='x', alpha=0.7)
plt.show()
```




```
mean_country_valuation_df =
↪  df[df['Country'].isin(country_valuation_df['Country'])].groupby('Country')['Valuation
↪  ($B)'].mean().reset_index().sort_values('Valuation ($B)', ascending=False).head(20)
mean_country_valuation_df
```

```
plt.figure(figsize=(12, 8), dpi=300)
ax = sns.barplot(mean_country_valuation_df,
                 y='Country',
                 x='Valuation ($B)',
                 hue='Country')
for i in ax.containers:
    ax.bar_label(i, fmt='%.2f')
plt.suptitle('Mean Distribution of Valuations across Different Countries')
plt.xlabel('Mean Valuation ($B)')
plt.ylabel('Countries')
plt.grid(axis='x', alpha=0.75)
plt.show()
```

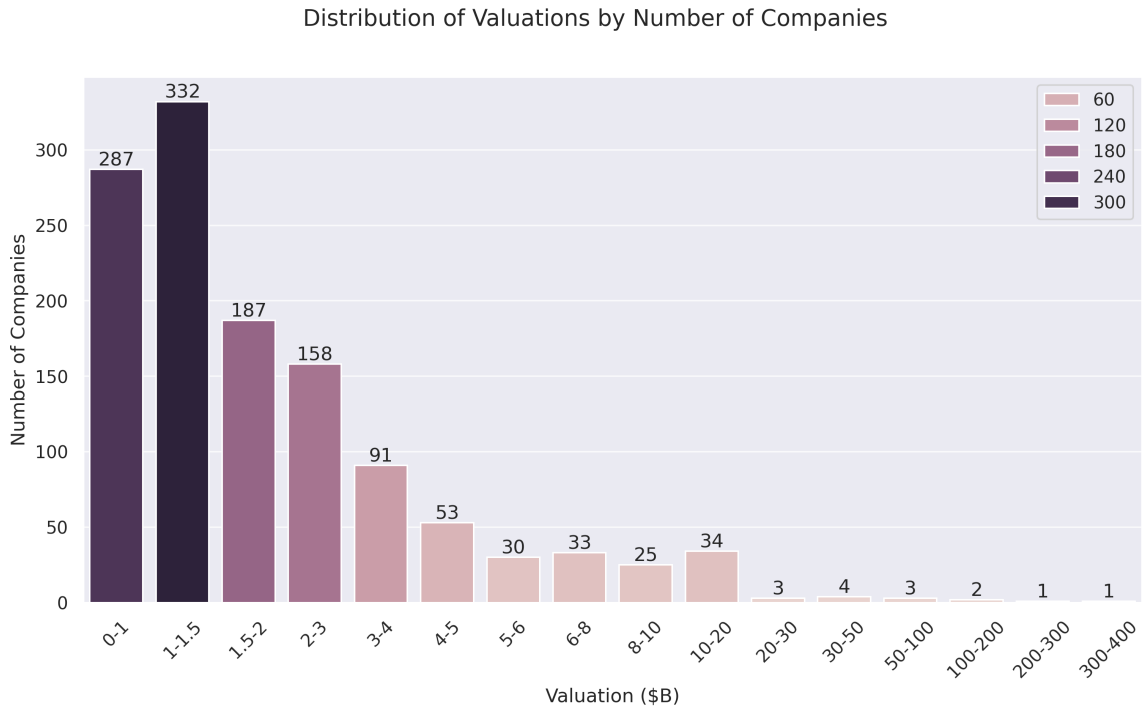


Distribution of Valuations by Number of Companies

```
# Define the bins for valuation ranges
bins = [0, 1, 1.5, 2, 3, 4, 5, 6, 8, 10, 20, 30, 50, 100, 200, 300, 400]
labels =  [f'{a}-{b}' for a, b in zip(bins[:-1], bins[1:])]
cuts = pd.cut(df['Valuation ($B)'], bins=bins, labels=labels)

# Count the number of companies in each bin
valuation_distribution = cuts.value_counts().sort_index()

# Plot the Bar Chart
plt.figure(figsize=(12, 6), dpi=300)
ax = sns.barplot(x=valuation_distribution.index,
                 y=valuation_distribution.values, hue=valuation_distribution.values)
for i in ax.containers:
    ax.bar_label(i)
plt.suptitle('Distribution of Valuations by Number of Companies')
plt.xlabel('Valuation ($B)')
plt.ylabel('Number of Companies')
plt.xticks(rotation=45)
plt.grid(axis='y', alpha=0.75)
#plt.yscale('log')
plt.show()
```

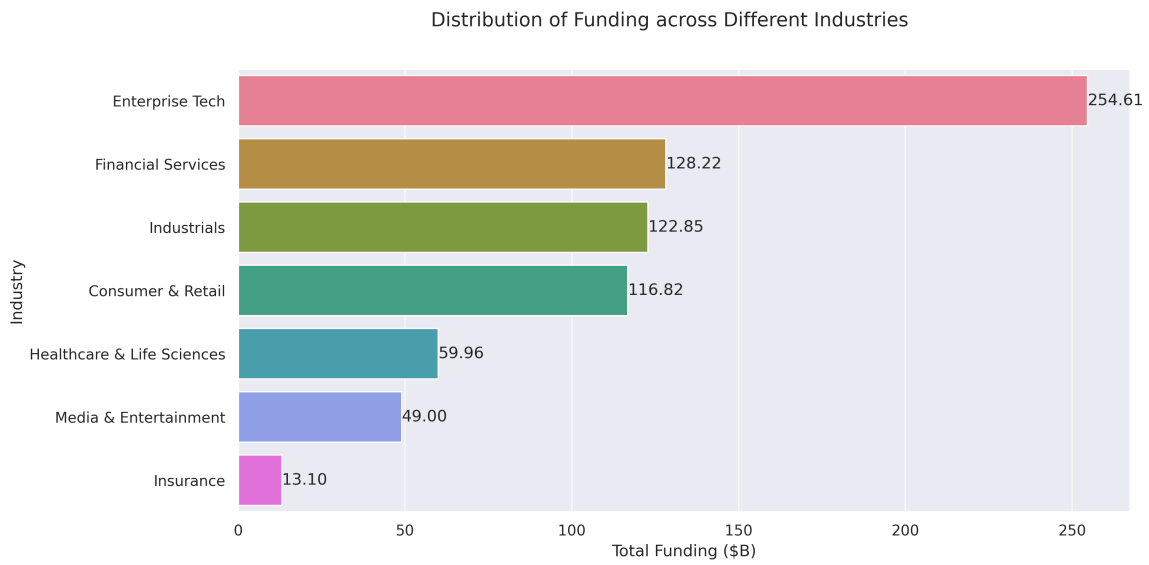


4.1.2 Funding

Distribution of Funding across Different Industries

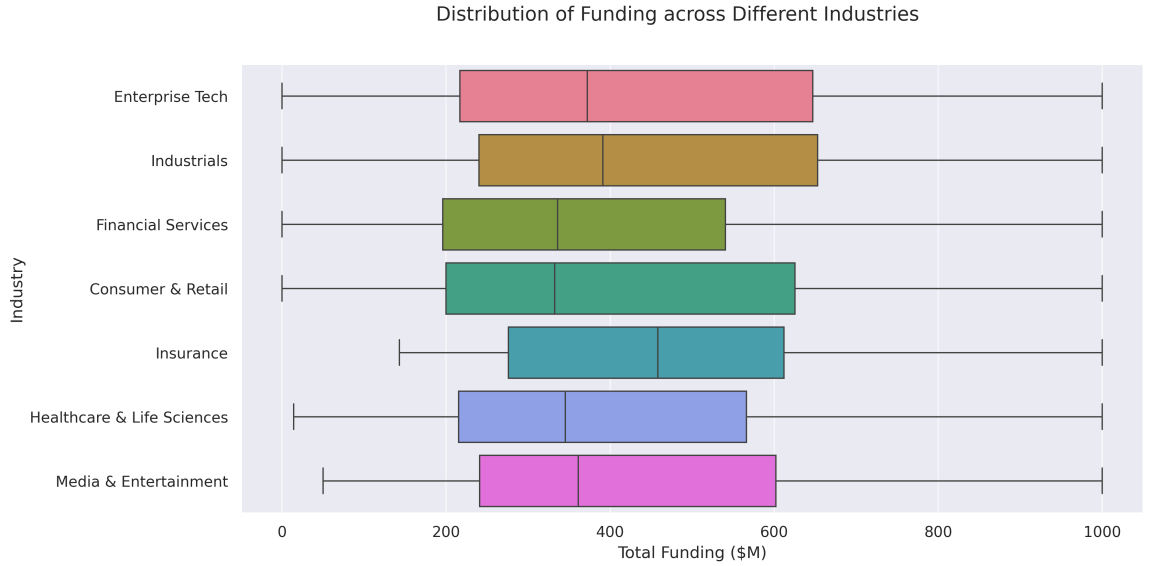
```
industry_funding_df = df.groupby('Industry')['Funding
↪  ($B)'].sum().reset_index().sort_values('Funding ($B)', ascending=False)
industry_funding_df
```

```
plt.figure(figsize=(12, 6), dpi=300)
ax = sns.barplot(industry_funding_df,
            y='Industry', x='Funding ($B)', hue='Industry')
for i in ax.containers:
    ax.bar_label(i, fmt='%.2f')
plt.suptitle('Distribution of Funding across Different Industries')
plt.xlabel('Total Funding ($B)')
plt.ylabel('Industry')
plt.grid(axis='x', alpha=0.75)
```



Mean Distribution of Funding across Different Industries

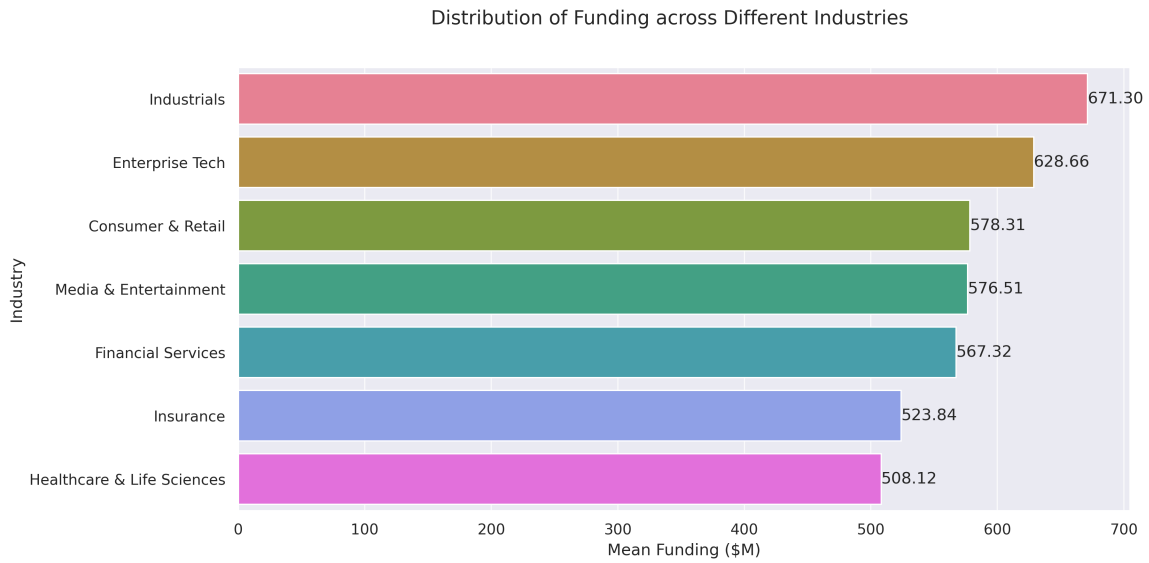
```
fig, ax = plt.subplots(figsize=(12, 6), dpi=300)
sns.boxplot(df, y='Industry', x='Funding ($M)', hue='Industry', showfliers=False)
plt.suptitle('Distribution of Funding across Different Industries')
ax.set(xlabel='Total Funding ($M)',
       ylabel='Industry')
plt.grid(axis='x', alpha=0.7)
plt.show()
```




```
industry_funding_df = df.groupby('Industry')['Funding
↪  ($M)'].mean().reset_index().sort_values('Funding ($M)', ascending=False)
industry_funding_df
```

```
plt.figure(figsize=(12, 6), dpi=300)
```

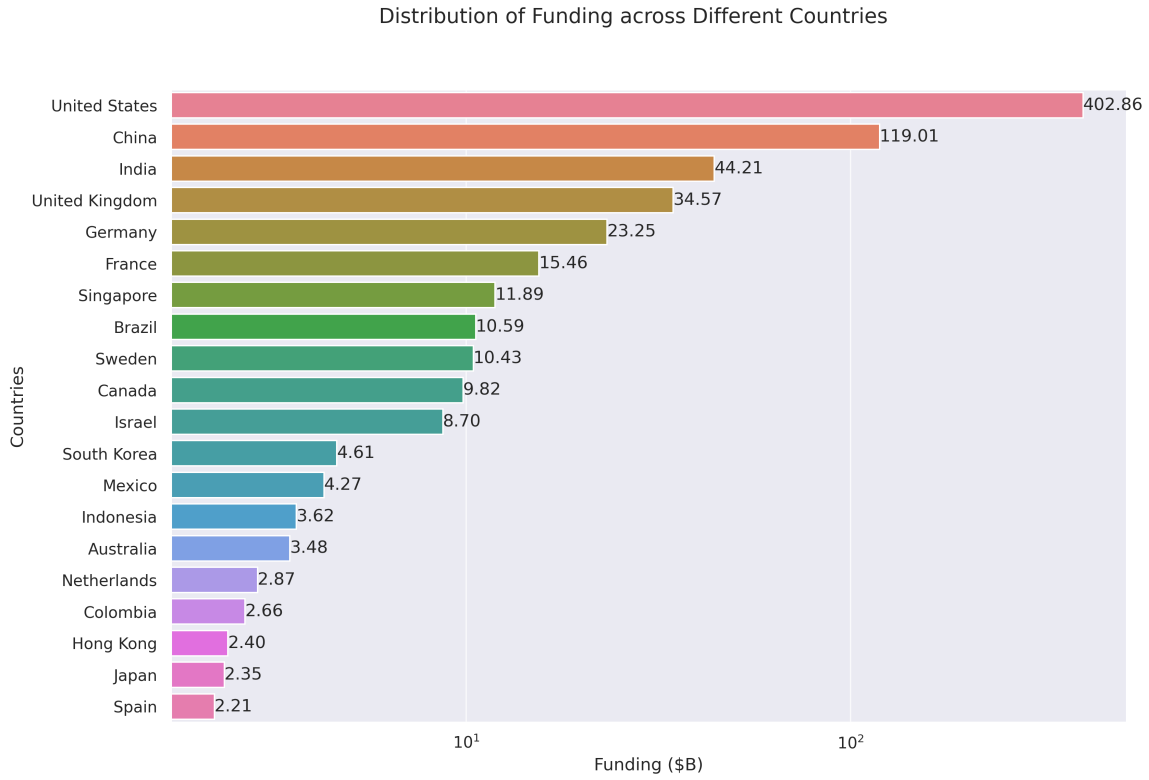
```
ax = sns.barplot(industry_funding_df,
                 y='Industry',
                 x='Funding ($M)',
                 hue='Industry')
for i in ax.containers:
    ax.bar_label(i, fmt='%.2f')
plt.suptitle('Distribution of Funding across Different Industries')
plt.xlabel('Mean Funding ($M)')
plt.ylabel('Industry')
plt.grid(axis='x', alpha=0.75)
plt.show()
```



Distribution of Funding across Different Countries

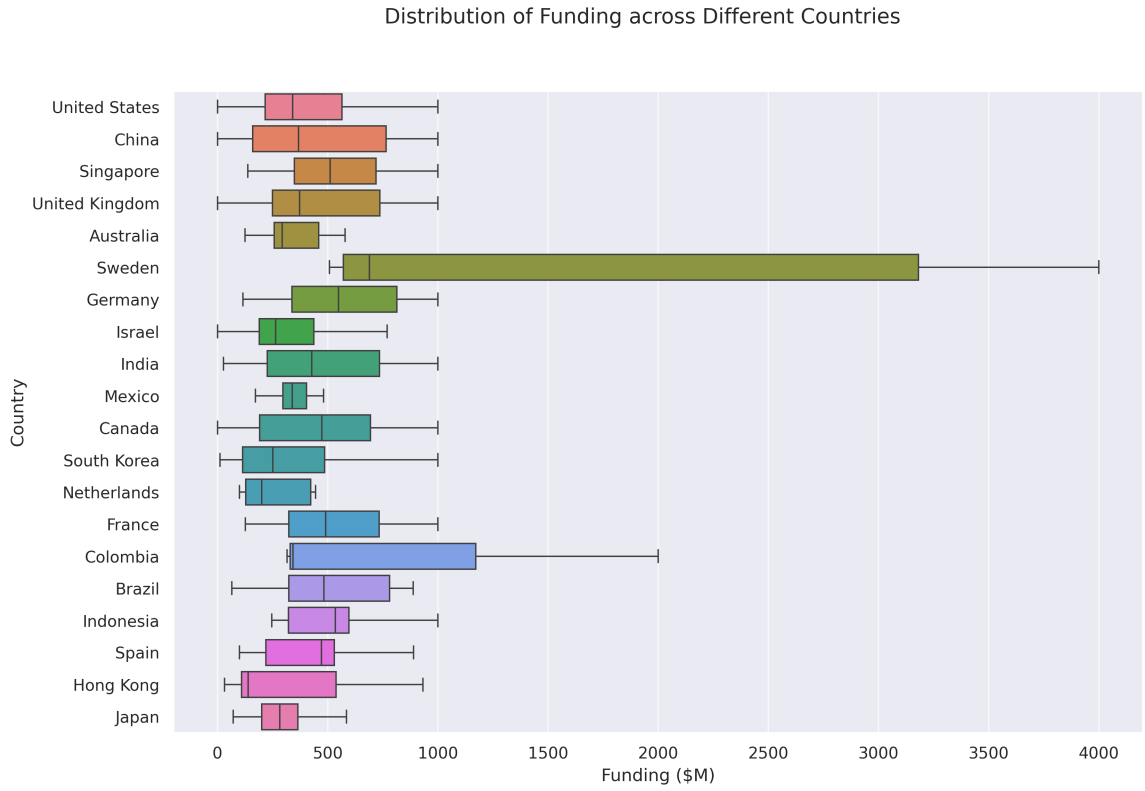
```
country_funding_df = df.groupby('Country')['Funding
↪  ($B)'].sum().reset_index().sort_values('Funding ($B)', ascending=False).head(20)
country_funding_df
```

```
plt.figure(figsize=(12, 8), dpi=300)
ax = sns.barplot(country_funding_df, y='Country', x='Funding ($B)', hue='Country')
for i in ax.containers:
    ax.bar_label(i, fmt='%.2f')
plt.suptitle('Distribution of Funding across Different Countries')
plt.xlabel('Funding ($B)')
plt.ylabel('Countries')
plt.grid(axis='x', alpha=0.75)
plt.xscale('log')
plt.show()
```



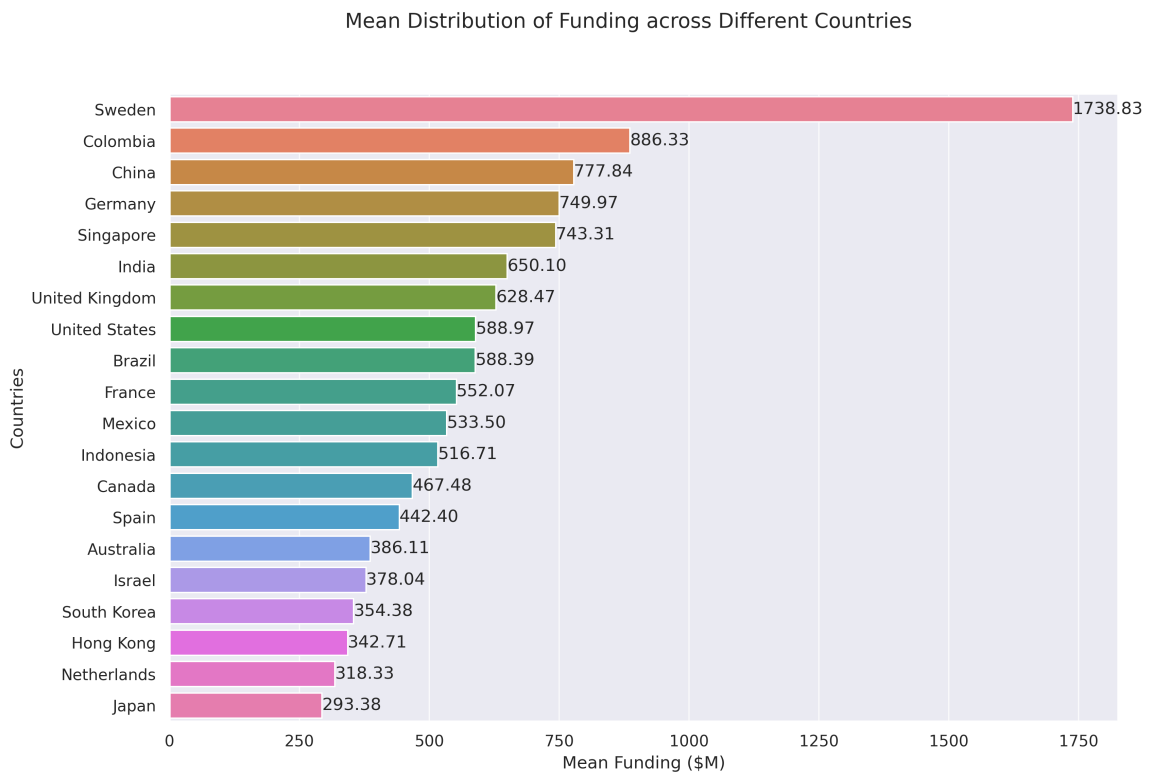
Mean Distribution of Funding across Different Countries

```
fig, ax = plt.subplots(figsize=(12,8), dpi=300)
sns.boxplot(df[df['Country'].isin(country_funding_df['Country'])], y='Country', x='Funding
↪  ($M)', hue='Country', showfliers=False)
plt.suptitle('Distribution of Funding across Different Countries')
ax.set(xlabel='Funding ($M)',
       ylabel='Country')
plt.grid(axis='x', alpha=0.7)
plt.show()
```




```
mean_country_funding_df =
↪  df[df['Country'].isin(country_funding_df['Country'])].groupby('Country')['Funding
↪  ($M)'].mean().reset_index().sort_values('Funding ($M)', ascending=False).head(20)
mean_country_funding_df
```

```
plt.figure(figsize=(12, 8), dpi=300)
ax = sns.barplot(mean_country_funding_df,
                 y='Country',
                 x='Funding ($M)',
                 hue='Country')
for i in ax.containers:
    ax.bar_label(i, fmt='%.2f')
plt.suptitle('Mean Distribution of Funding across Different Countries')
plt.xlabel('Mean Funding ($M)')
plt.ylabel('Countries')
plt.grid(axis='x', alpha=0.75)
plt.show()
```

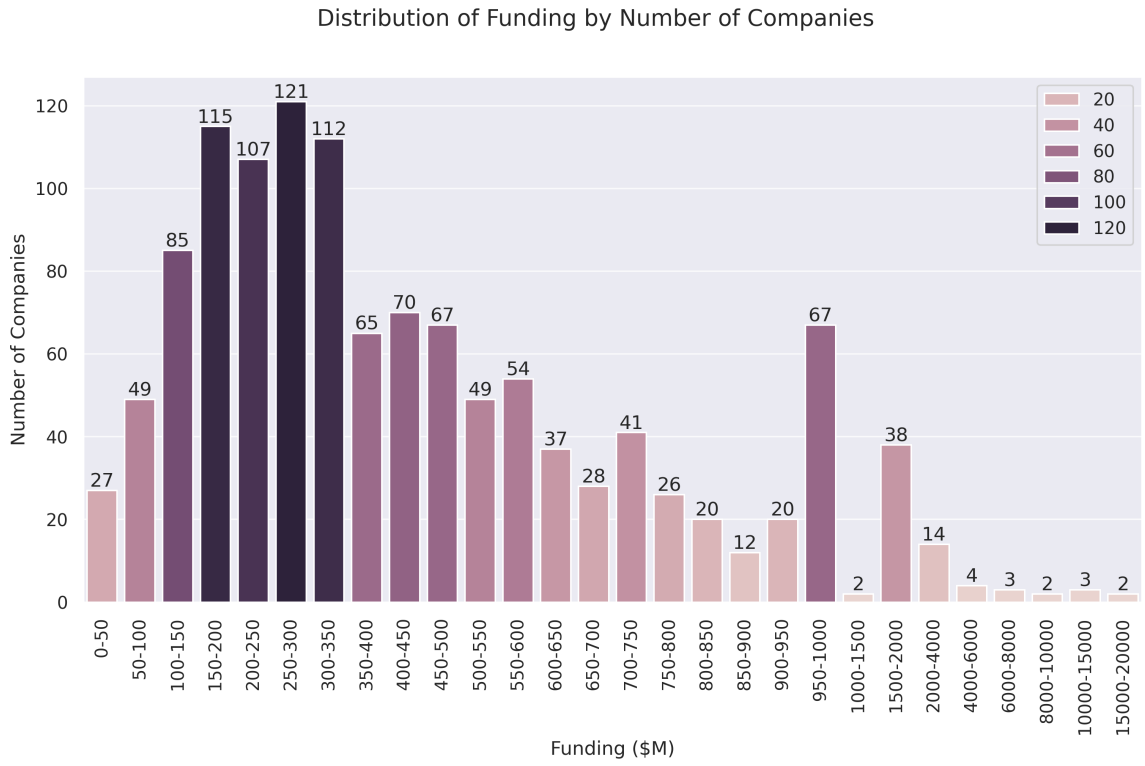


Distribution of Funding by Number of Companies

```
# Define the bins for funding ranges
# bins = [0, 0.2, 0.3, 0.5, 0.8, 1, 2, 4, 6, 8, 10, 12, 15, 20]
# labels =  [f'{a}-{b}' for a, b in zip(bins[:-1], bins[1:])]
bins =
↪  [0,50,100,150,200,250,300,350,400,450,500,550,600,650,700,750,800,850,900,950,1000,1500,2000,4000,6
labels =  [f'{a}-{b}' for a, b in zip(bins[:-1], bins[1:])]
cuts = pd.cut(df['Funding ($M)'], bins=bins, labels=labels)

# Count the number of companies in each bin
funding_distribution = cuts.value_counts().sort_index()

# Plot the Bar Chart
plt.figure(figsize=(12, 6), dpi=300)
ax = sns.barplot(x=funding_distribution.index,
                 y=funding_distribution.values, hue=funding_distribution.values)
for i in ax.containers:
    ax.bar_label(i)
plt.suptitle('Distribution of Funding by Number of Companies')
plt.xlabel('Funding ($M)')
plt.ylabel('Number of Companies')
plt.xticks(rotation=90)
plt.grid(axis='y', alpha=0.75)
# plt.yscale('log')
plt.show()
```



5 Comparative Analysis

5.1 By Company

5.1.1 Top Companies by Valuation

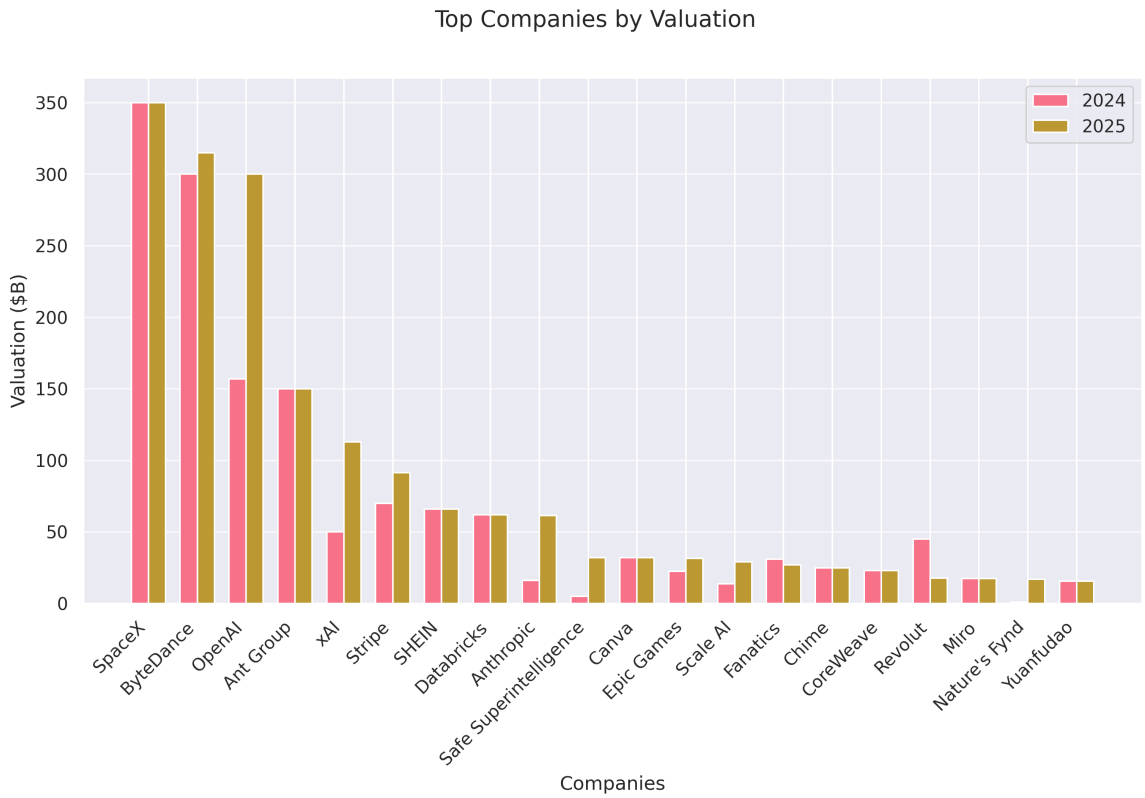
```
top_companies = df.sort_values(by='Latest Valuation ($B)', ascending=False).head(20)
top_companies
```

```
# Set the positions and width for the bars
N = len(top_companies)
ind = np.arange(N)  # the x locations for the groups
width = 0.35  # the width of the bars

# Create the bars for valuation and funding
fig, ax = plt.subplots(figsize=(12, 6), dpi=300)
bars1 = ax.bar(ind, top_companies['Valuation ($B)'], width, label='2024')
bars2 = ax.bar(ind + width, top_companies['Latest Valuation ($B)'], width, label='2025')

# Add labels and title
ax.set(xlabel='Companies',
       ylabel='Valuation ($B)')
ax.set_xticks(ind+width/2, top_companies['Company'], rotation=45, ha='right')
ax.legend()
ax.grid(axis='y', alpha=0.75)
plt.suptitle('Top Companies by Valuation')
```

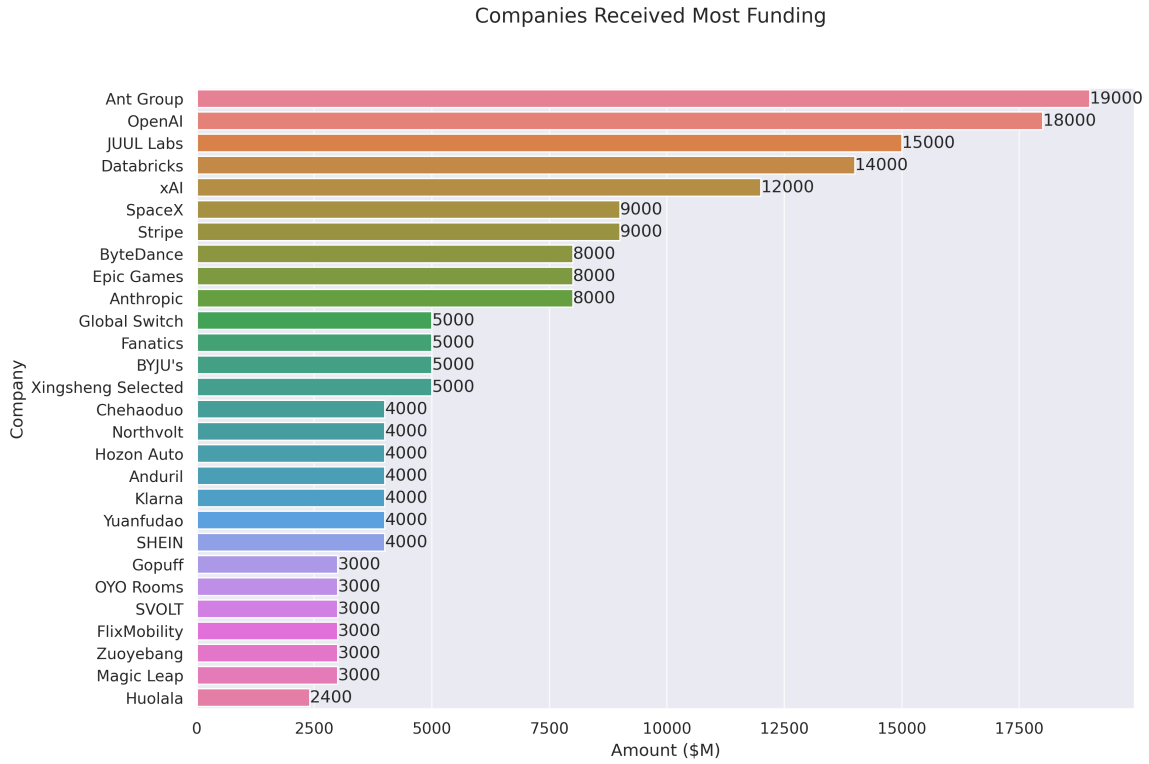
```
plt.show()
```



5.1.2 Companies Received Most Funding

```
top_companies = df[df['Funding ($M)']>2000].sort_values(by='Funding ($M)',
↪  ascending=False).head(30)
top_companies
```

```
plt.subplots(figsize=(12, 8), dpi=300)
ax = sns.barplot(top_companies, y='Company', x='Funding ($M)', hue='Company')
for i in ax.containers:
    ax.bar_label(i)
plt.suptitle('Companies Received Most Funding')
plt.xlabel('Amount ($M)')
plt.grid(axis='x', alpha=0.75)
plt.show()
```



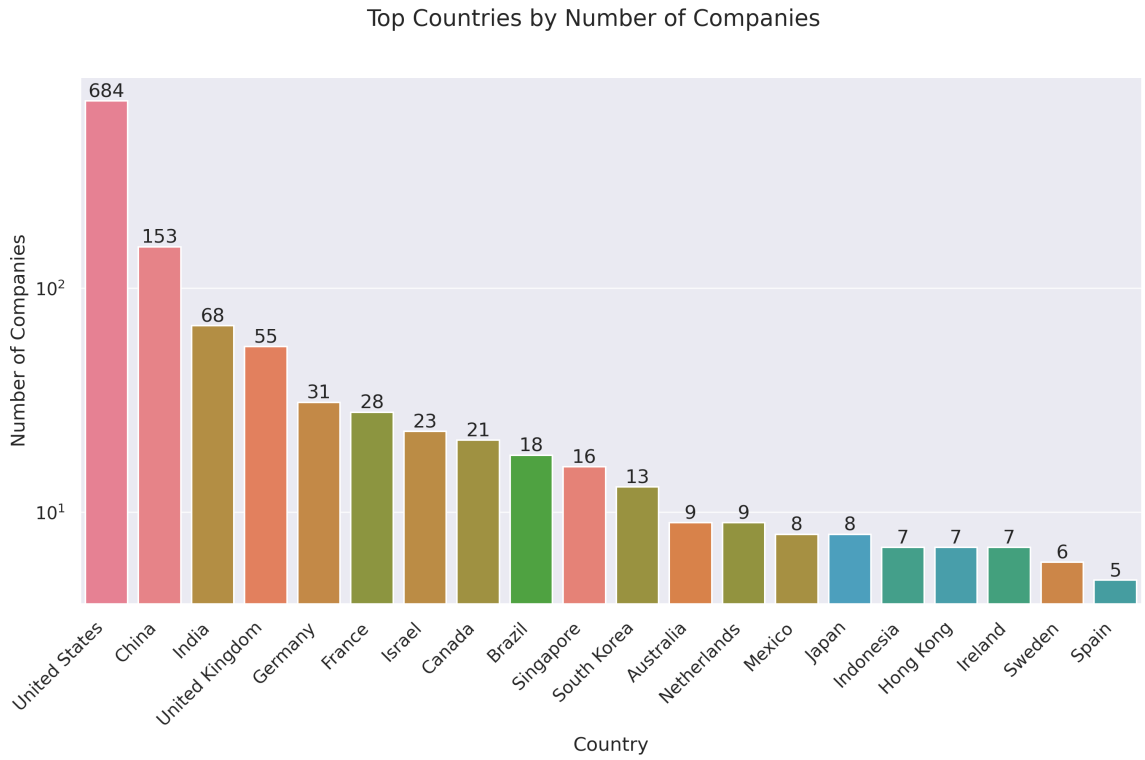
5.2 By Country

```
top_countries = df['Country'].value_counts().nlargest(8).index
top_countries
```

```
Index(['United States', 'China', 'India', 'United Kingdom', 'Germany', 'France', 'Israel
```

5.2.1 Top Countries by Number of Companies

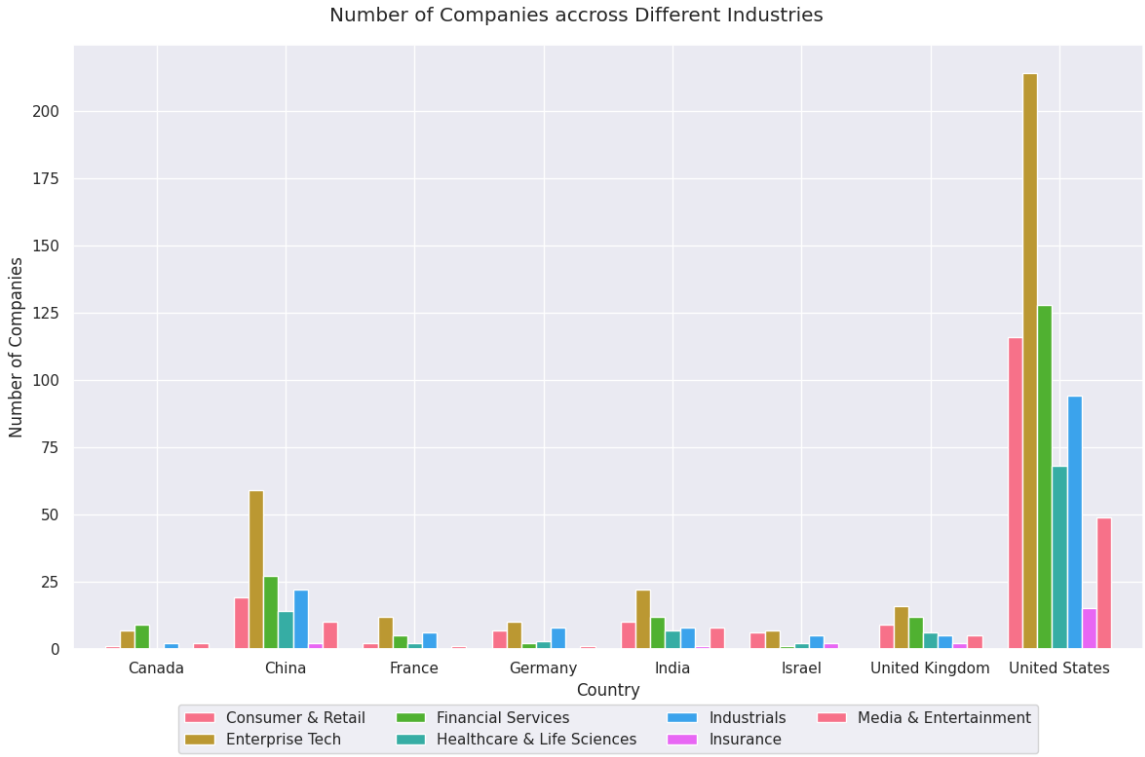
```
plt.subplots(figsize=(12, 6), dpi=300)
ax = sns.countplot(x=df['Country'],
                   order=df['Country'].value_counts().nlargest(20).index,
                   hue=df['Country'])
for i in ax.containers:
    ax.bar_label(i)
plt.suptitle('Top Countries by Number of Companies')
plt.ylabel('Number of Companies')
plt.xticks(rotation=45, ha='right')
plt.grid(axis='y', alpha=0.75)
plt.yscale('log')
plt.show()
```



5.2.2 Top Countries by Number of Companies across Different Industries

```
grouped_df = df[df['Country'].isin(top_countries)].groupby(['Country',
↪  'Industry']).size().unstack(fill_value=0)
grouped_df
```

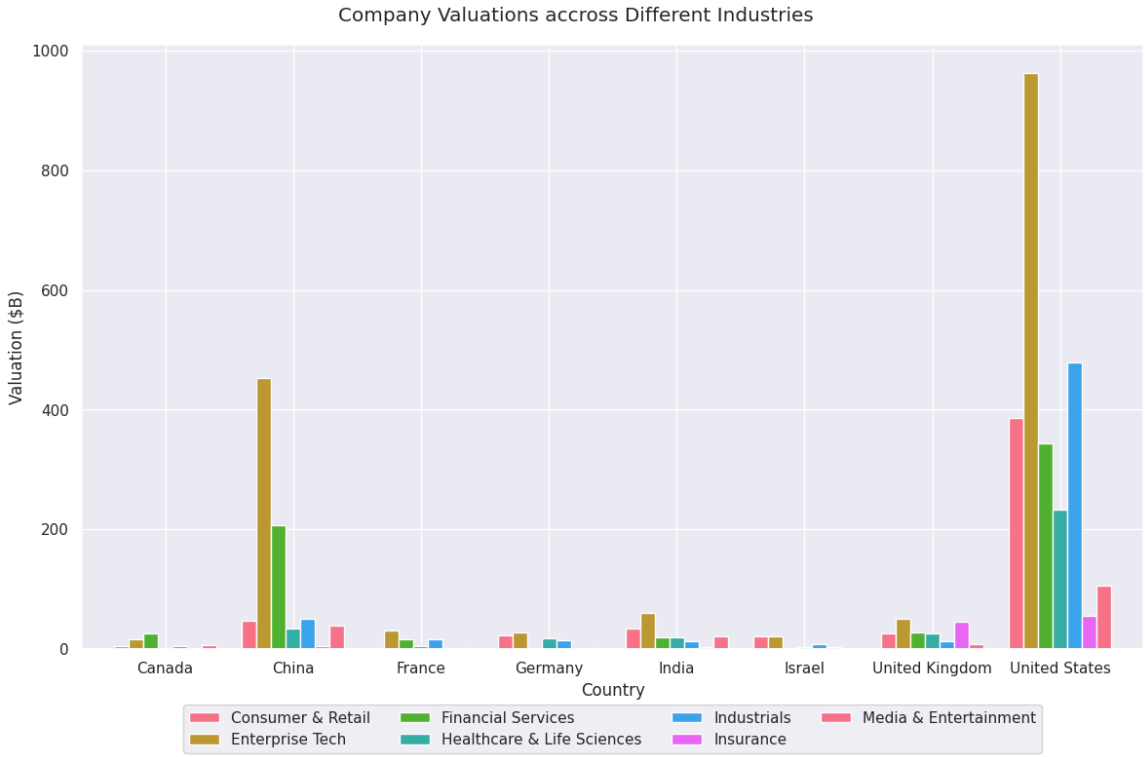
```
grouped_df.plot(kind='bar', figsize=(12, 8), width=0.8)
plt.suptitle('Number of Companies accross Different Industries')
plt.xlabel('Country')
plt.ylabel('Number of Companies')
plt.xticks(rotation=0)  # Keep x-axis labels horizontal
plt.legend(ncol=4, loc="upper center", bbox_to_anchor=(0.5,-0.08))
plt.grid(True)
plt.tight_layout()
# plt.yscale('log')
plt.show()
```



5.2.3 Top Countries by Company Valuations across Different Industries

```
grouped_df = df[df['Country'].isin(top_countries)].groupby(['Country',
↪  'Industry'])['Valuation ($B)'].sum().unstack(fill_value=0)
grouped_df
```

```
grouped_df.plot(kind='bar', figsize=(12, 8), width=0.8)
plt.suptitle('Company Valuations accross Different Industries')
plt.xlabel('Country')
plt.ylabel('Valuation ($B)')
plt.xticks(rotation=0)  # Keep x-axis labels horizontal
plt.legend(ncol=4, loc="upper center", bbox_to_anchor=(0.5,-0.08))
plt.grid(True)
plt.tight_layout()
plt.show()
```

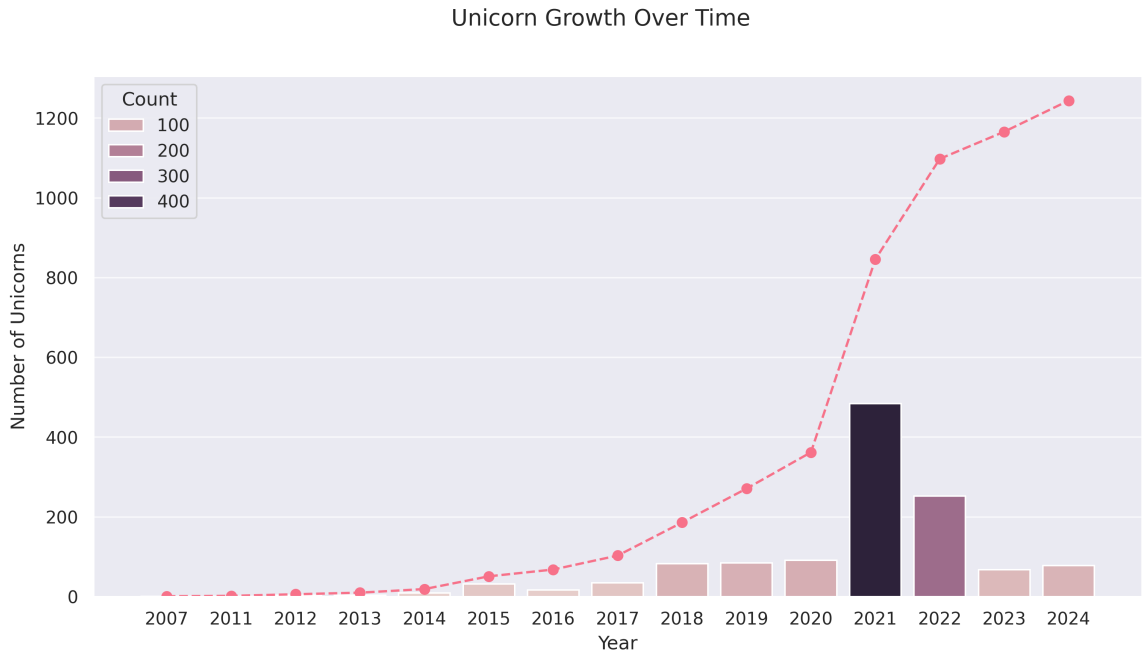


6 Time-Based Analysis

6.1 Unicorn Growth Over Time

```
_df = df.groupby('Unicorn Year').size().reset_index(name='Count')
_df['Accumulated Count'] = _df['Count'].cumsum()
_df
```

```
plt.subplots(figsize=(12, 6), dpi=300)
sns.barplot(_df, x='Unicorn Year', y='Count', hue='Count')
plt.plot(_df['Accumulated Count'], marker='o', linestyle='dashed')
plt.suptitle('Unicorn Growth Over Time')
plt.xlabel('Year')
plt.ylabel('Number of Unicorns')
plt.grid(axis='y', alpha=0.7)
plt.show()
```



The surge of unicorns was reported as "meteoric" for 2021, with $71 billion invested in 340 new companies, a banner year for startups and for the US venture capital industry; the unprecedented number of companies valued at more than $1 billion during 2021 exceeded the sum total of the five previous years.

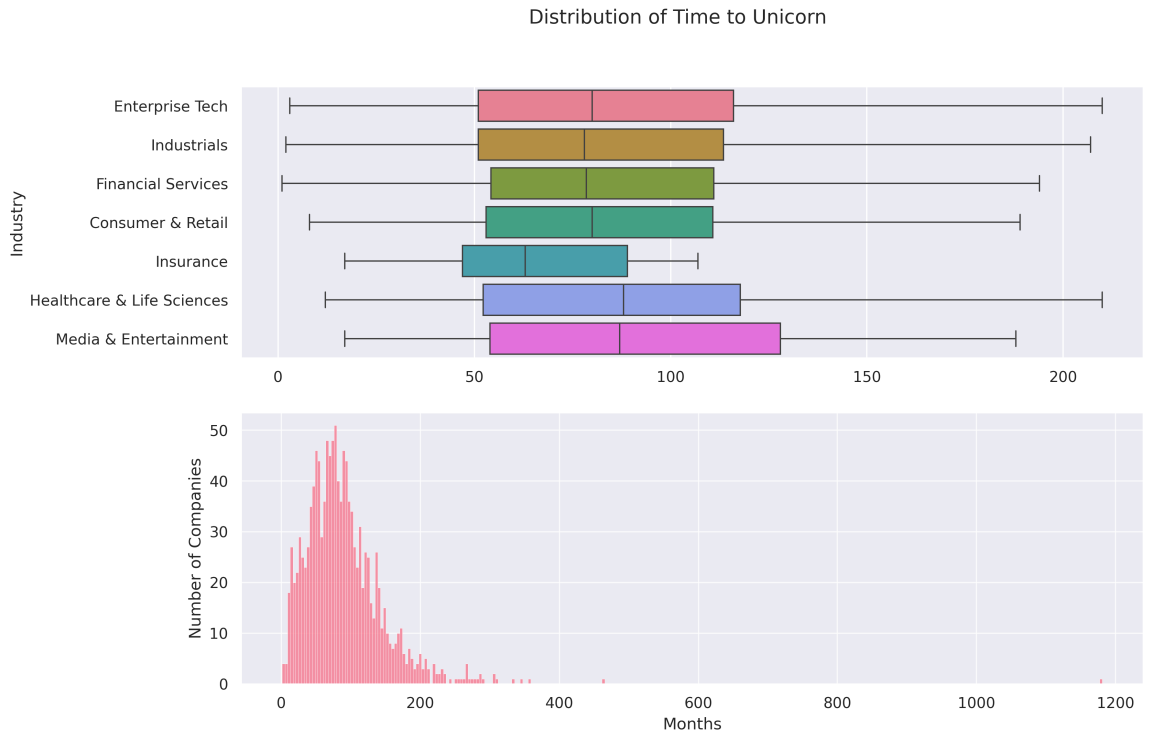
6.2 Time to Unicorn

```
# Function to convert "Years to Unicorn" into total months
def convert_years_to_months(years_str):
    if 'y' in years_str and 'm' in years_str:
        years, months = years_str.split('y')
        months = months.replace('m', '').strip()
        return int(years.strip()) * 12 + int(months)
    elif 'y' in years_str:
        years = years_str.replace('y', '').strip()
        return int(years) * 12
    elif 'm' in years_str:
        months = years_str.replace('mo', '').replace('m', '').strip()
        return int(months)
    else:
        return None

df['Years to Unicorn (Months)'] = df['Years to Unicorn'].apply(convert_years_to_months)
```

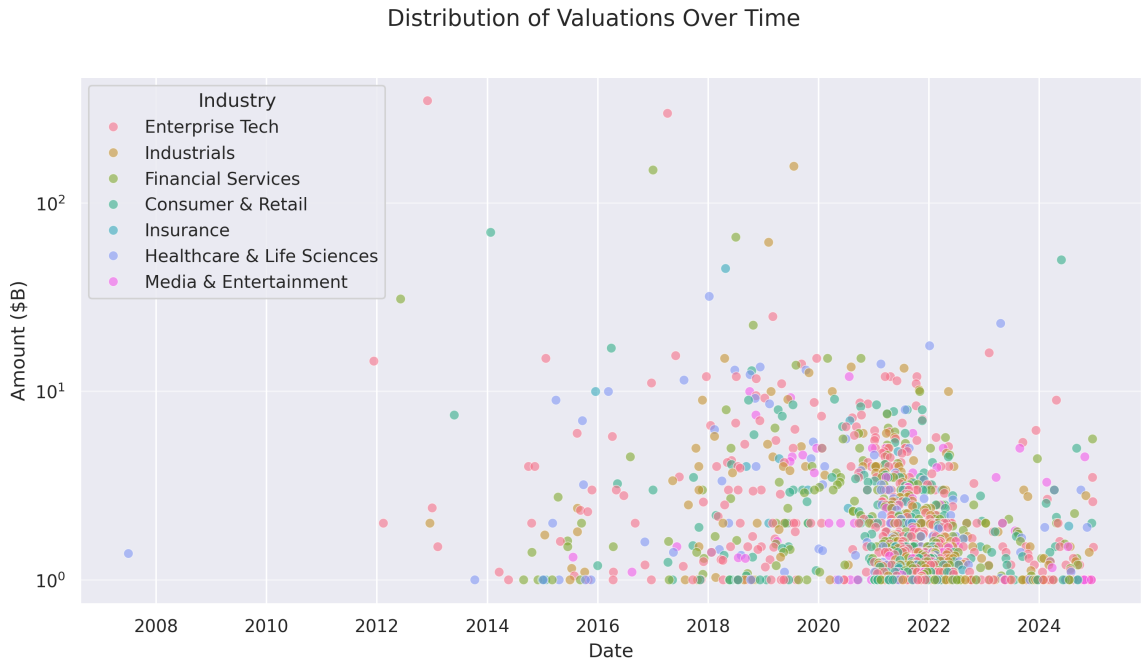
```
fig, ax = plt.subplots(2, 1, figsize=(12, 8), dpi=300)
sns.boxplot(df, x='Years to Unicorn (Months)', y='Industry', hue='Industry', ax=ax[0],
↪  showfliers=False)
ax[0].set(xlabel=None)
sns.histplot(df['Years to Unicorn (Months)'].dropna(), bins=300, ax=ax[1])
ax[1].set(xlabel='Months', ylabel='Number of Companies')
```

```
plt.suptitle('Distribution of Time to Unicorn')
plt.grid(alpha=0.75)
plt.show()
```



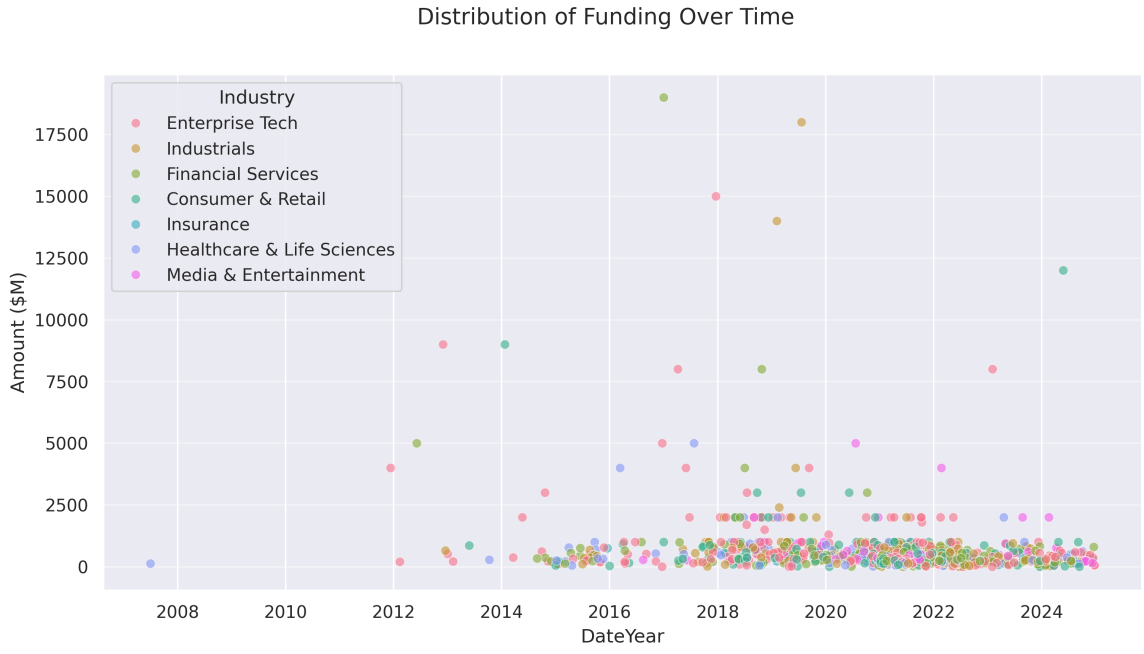
6.3 Distribution of Valuations Over Time

```
plt.subplots(figsize=(12, 6), dpi=300)
sns.scatterplot(df, x='Unicorn Date', y='Valuation ($B)', alpha=.6, hue='Industry')
plt.suptitle('Distribution of Valuations Over Time')
plt.xlabel('Date')
plt.ylabel('Amount ($B)')
# plt.xticks(df['Unicorn Year'].unique(), rotation=45)
plt.grid(axis='y', alpha=0.5)
plt.yscale('log')
plt.show()
```



6.4 Distribution of Funding Over Time

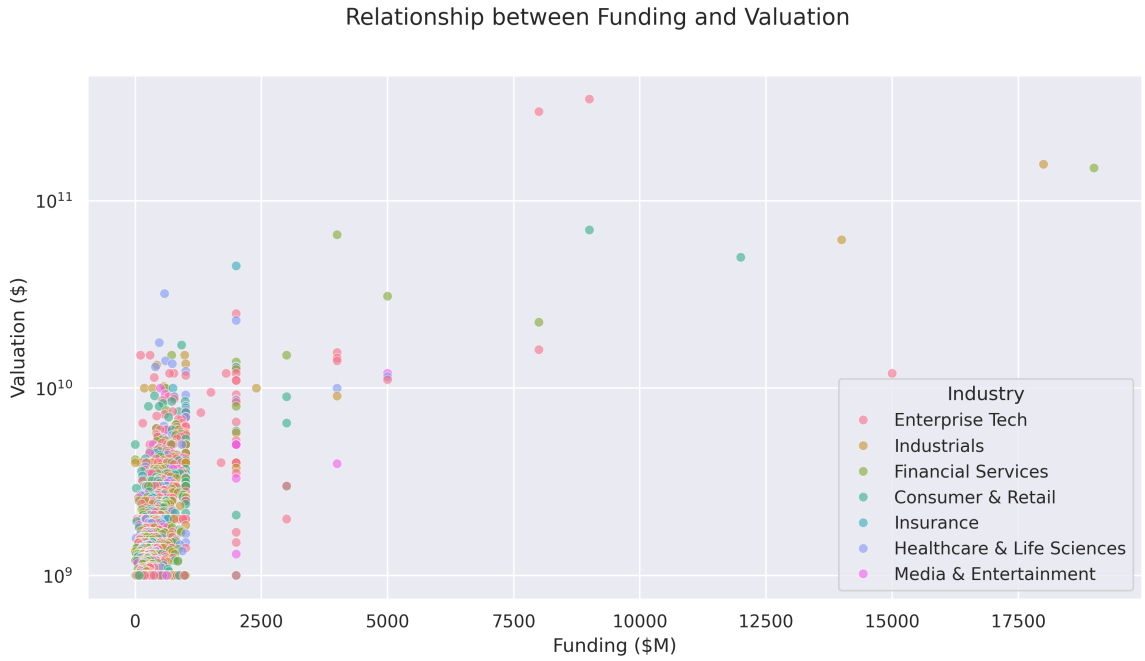
```
plt.subplots(figsize=(12, 6), dpi=300)
sns.scatterplot(df, x='Unicorn Date', y=df['Funding ($M)'], alpha=0.6, hue='Industry')
plt.suptitle('Distribution of Funding Over Time')
plt.xlabel('Date')
plt.ylabel('Amount ($M)')
# plt.xticks(df['Unicorn Year'].unique(), rotation=45)
plt.grid(axis='y', alpha=0.5)
# plt.yscale('log')
plt.show()
```



7 Correlation Analysis

7.1 Relationship between Funding and Valuation

```
plt.subplots(figsize=(12, 6), dpi=300)
sns.scatterplot(df, x=df['Total Equity Funding ($)']/1e6, y=df['Valuation ($B)']*1e9,
↪  alpha=0.6, hue='Industry')
plt.suptitle('Relationship between Funding and Valuation')
plt.xlabel('Funding ($M)')
plt.ylabel('Valuation ($)')
plt.grid(True)
# plt.xscale('log')
plt.yscale('log')
plt.show()
```



8 Investor Analysis

8.1 Top Investors

```
top_investors = df.explode('Investors')\
                  .groupby('Investors')['Latest Valuation ($B)']\
                  .agg(['count', 'sum'])\
                  .sort_values(by=['sum', 'count'], ascending=False)\
                  .head(50)
print(top_investors)
```

```
                                count      sum
```

Investors		
RRE Ventures	5	397.60
Founders Fund	24	363.01
Relay Ventures	2	358.00
Opus Capital	2	355.70
Breyer Capital	5	320.16
Parkway VC	2	316.00
TIME Ventures	1	315.00
Susa Ventures	2	304.90
Dynamo VC	1	300.00
Andreessen Horowitz	72	184.51
Sequoia Capital China	40	183.61
Sequoia Capital	59	177.57
Alibaba Group	9	163.39
Accel	65	163.21
New Enterprise Associates	26	158.00
The Carlyle Group	5	154.55
CPP Investments	1	150.00
Tiger Global Management	56	144.53
Index Ventures	38	139.65
General Atlantic	30	138.95
Lightspeed Venture Partners	42	121.19
TDM Growth Partners	2	121.00
Insight Partners	49	120.07
Baillie Gifford & Co.	3	117.40
Prysm Capital	2	115.10
General Catalyst	41	113.46
ZhenFund	7	108.20
K2 Ventures	1	91.50
Institutional Venture Partners	13	85.74
Temasek	10	74.58
IDG Capital	27	72.08
Bessemer Venture Partners	32	71.36
Tencent Holdings	29	69.03
Google Ventures	28	68.81
369 Growth Partners	1	66.00
Berkeley Hills Capital	1	66.00
GTM Capital	1	66.00
Holtzbrinck Ventures	2	64.00
Unternehmertum Venture Capital	1	62.00
NVentures	1	61.50
SoftBank Group	29	59.68
Sequoia Capital India	23	57.97
Coatue Management	21	53.79

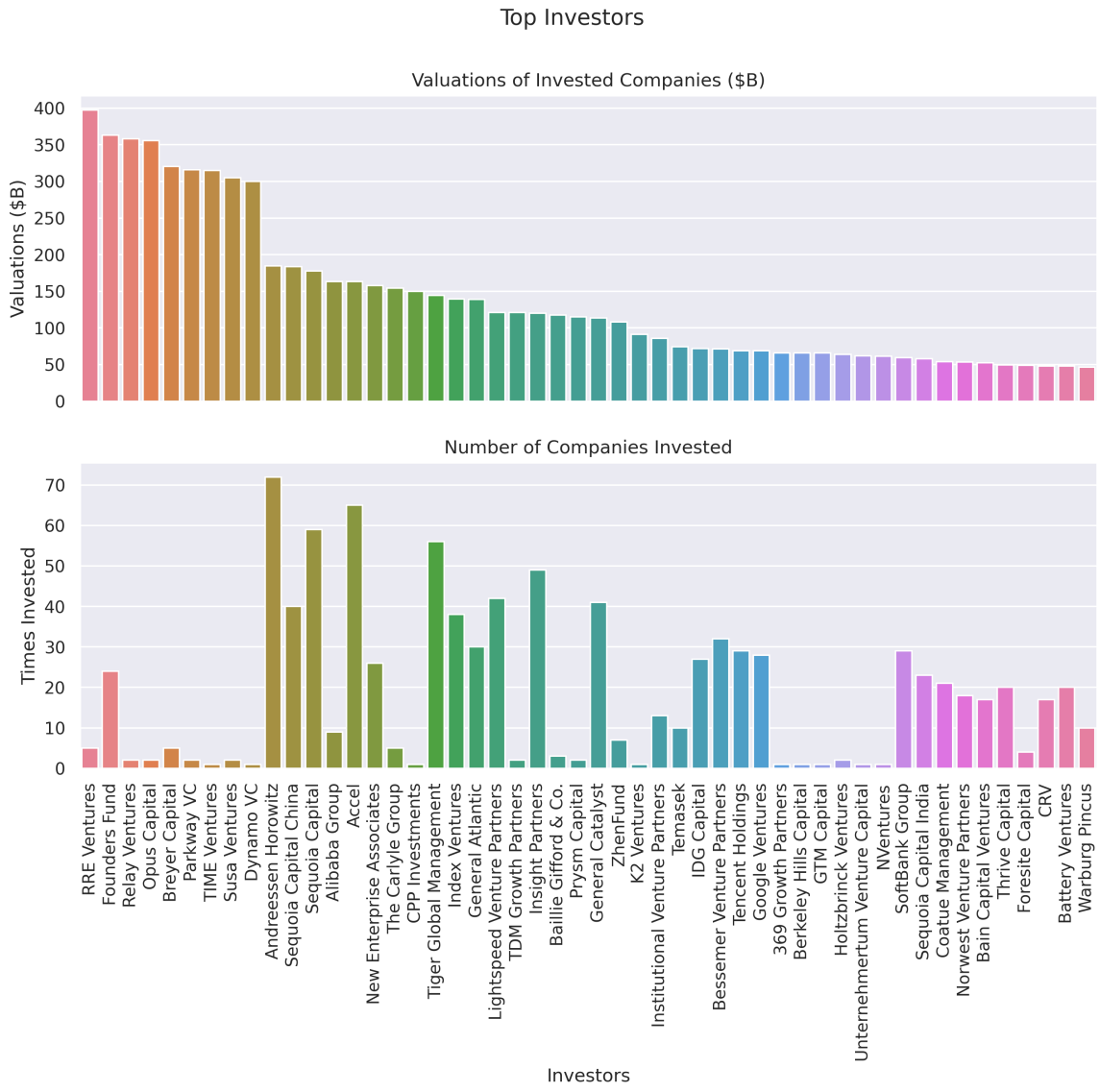
```
Norwest Venture Partners          18   53.43
Bain Capital Ventures             17   52.66
Thrive Capital                    20   49.68
Foresite Capital                   4   49.20
CRV                               17   48.18
Battery Ventures                  20   48.07
Warburg Pincus                    10   46.37
```

```
fig, ax = plt.subplots(2, 1, figsize=(12, 8), dpi=300, sharex=True)

sns.barplot(top_investors, ax=ax[0], y='sum', x=top_investors.index,
↪  hue=top_investors.index, legend=False)
ax[0].set(ylabel='Valuations ($B)', title='Valuations of Invested Companies ($B)')

sns.barplot(top_investors, ax=ax[1], y='count', x=top_investors.index,
↪  hue=top_investors.index, legend=False)
ax[1].set(ylabel='Times Invested', title='Number of Companies Invested')

plt.xticks(rotation=90)
plt.suptitle('Top Investors')
plt.show()
```



9 Founder Analysis

9.1 Top Founders

```
top_founders = df.explode('Founder(s)')\
                 .groupby('Founder(s)')['Latest Valuation ($B)']\
                 .agg(['count', 'sum'])\
                 .sort_values(by=['sum', 'count'], ascending=False)\
                 .head(50)
print(top_founders)
```

```
                    count     sum
Founder(s)
Elon Musk               3  468.70
Ilya Sutskever          2  332.00
```

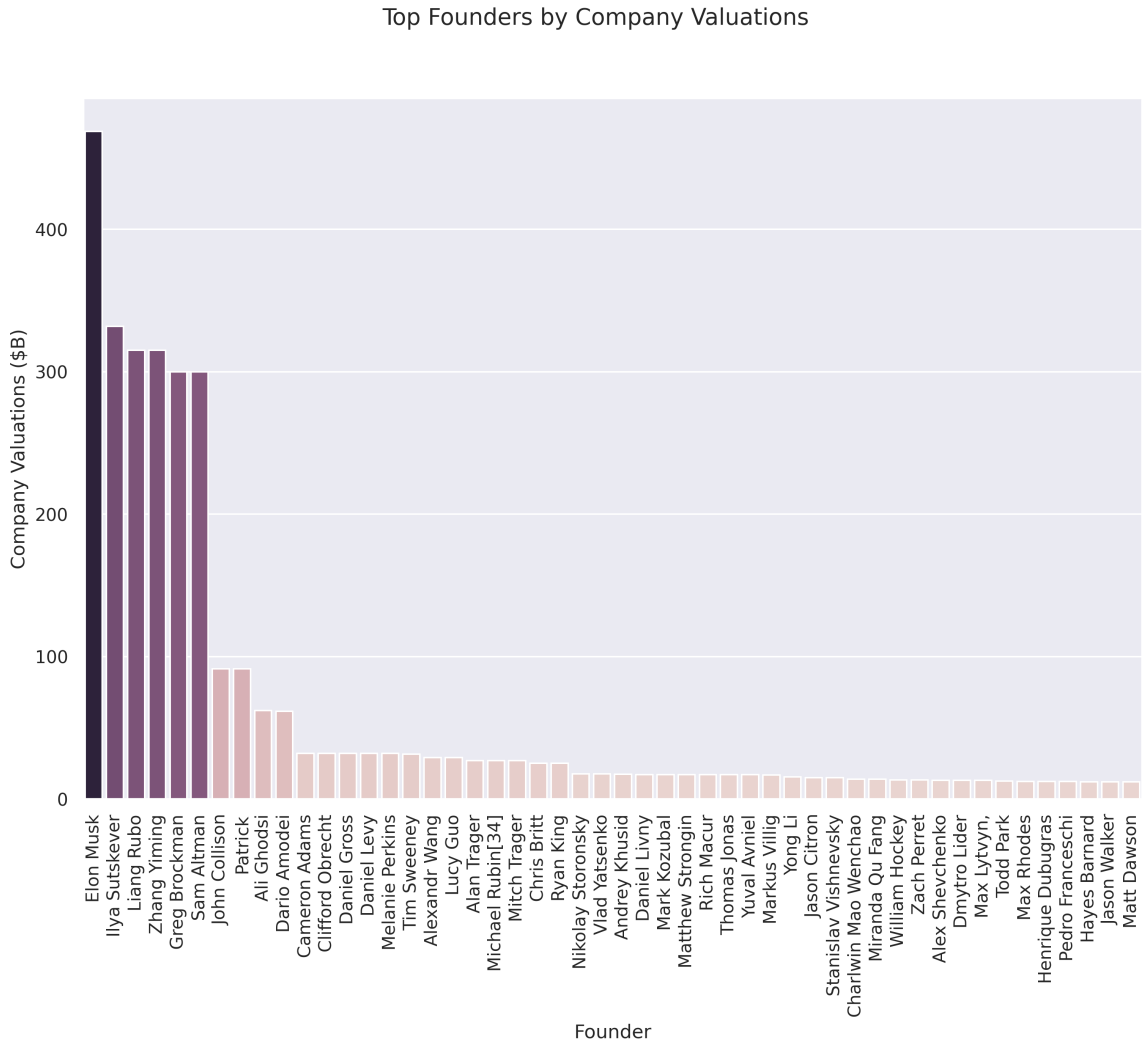
Liang Rubo	1	315.00
Zhang Yiming	1	315.00
Greg Brockman	1	300.00
Sam Altman	1	300.00
John Collison	1	91.50
Patrick	1	91.50
Ali Ghodsi	1	62.00
Dario Amodei	1	61.50
Cameron Adams	1	32.00
Clifford Obrecht	1	32.00
Daniel Gross	1	32.00
Daniel Levy	1	32.00
Melanie Perkins	1	32.00
Tim Sweeney	1	31.50
Alexandr Wang	1	29.00
Lucy Guo	1	29.00
Alan Trager	1	27.00
Michael Rubin[34]	1	27.00
Mitch Trager	1	27.00
Chris Britt	1	25.00
Ryan King	1	25.00
Nikolay Storonsky	1	17.75
Vlad Yatsenko	1	17.75
Andrey Khusid	1	17.50
Daniel Livny	1	17.00
Mark Kozubal	1	17.00
Matthew Strongin	1	17.00
Rich Macur	1	17.00
Thomas Jonas	1	17.00
Yuval Avniel	1	17.00
Markus Villig	2	16.80
Yong Li	1	15.50
Jason Citron	1	15.00
Stanislav Vishnevsky	1	15.00
Charlwin Mao Wenchao	1	14.00
Miranda Qu Fang	1	14.00
William Hockey	1	13.40
Zach Perret	1	13.40
Alex Shevchenko	1	13.00
Dmytro Lider	1	13.00
Max Lytvyn,	1	13.00
Todd Park	1	12.60
Max Rhodes	1	12.40
Henrique Dubugras	1	12.30

```
Pedro Franceschi          1   12.30
Hayes Barnard             1   12.00
Jason Walker              1   12.00
Matt Dawson               1   12.00
```

```
fig, ax = plt.subplots(figsize=(12, 8), dpi=300, sharex=True)

ax = sns.barplot(top_founders, y='sum', x=top_founders.index, hue='sum', legend=False)
ax.set(ylabel='Company Valuations ($B)', xlabel='Founder')

plt.xticks(rotation=90)
plt.suptitle('Top Founders by Company Valuations')
plt.show()
```



10 Historical Analysis

10.1 Survival and Acquisition

1. Find out companies no longer listed as unicorns in 2024

```
df_2022 = pd.read_csv('input/datasets/Unicorn_Companies (March 2022).csv')
df_2022['Valuation ($B)'] = pd.to_numeric(df_2022['Valuation ($B)'].str.replace('$',
↪  ''))
df_out = df_2022[~df_2022['Company'].str.lower().isin(df['Company'].str.lower())]
```

```
178 companies no longer listed in 2024 unicorn list
```

```
df_out.head()
```

2. Financial Stage

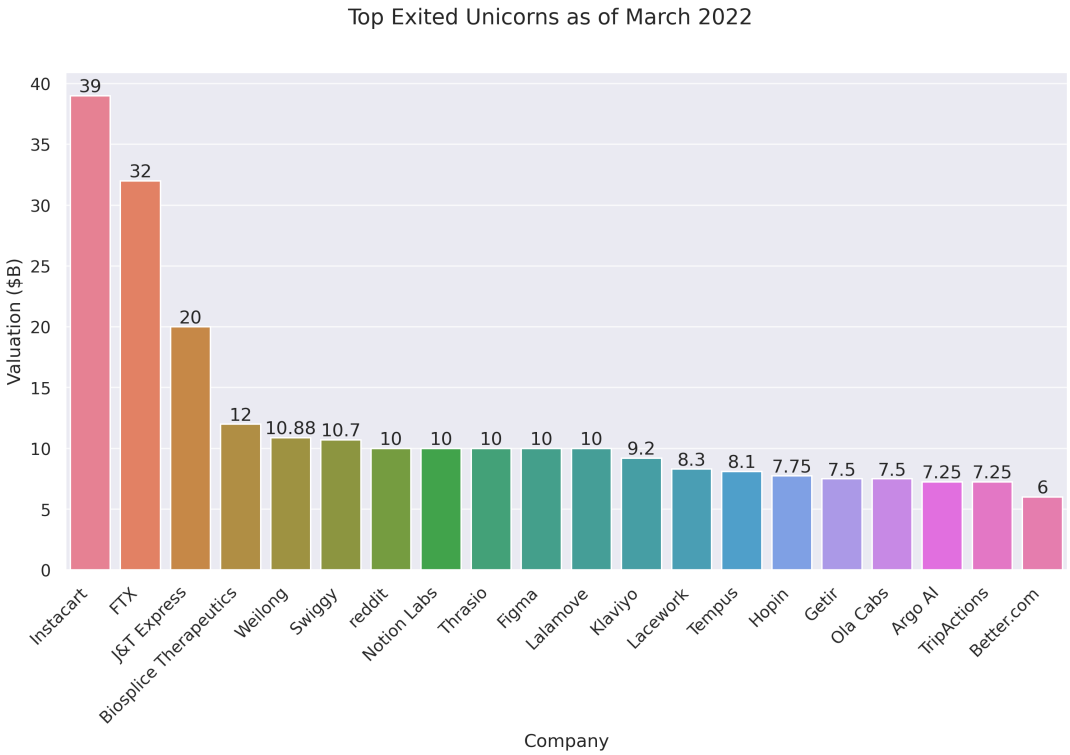
```
df_out.size()
```

```
Financial Stage
Acq             1
Acquired        7
Divestiture     1
IPO             2
dtype: int64
```

3. Top Exited Unicorns as of March 2022

```
df_top_companies = df_out.sort_values('Valuation ($B)', ascending=False).head(20)
df_top_companies
```

```
plt.subplots(figsize=(12, 6), dpi=300)
ax = sns.barplot(df_top_companies,
                 x='Company',
                 y='Valuation ($B)',
                 hue='Company')
for i in ax.containers:
    ax.bar_label(i)
plt.suptitle('Top Exited Unicorns as of March 2022')
plt.ylabel('Valuation ($B)')
plt.xlabel('Company')
plt.xticks(rotation=45, ha='right')
plt.grid(axis='y', alpha=0.75)
plt.show()
```



11 Funded by Y-Combinator

Y Combinator, founded in 2005 by Paul Graham and others, is a prestigious startup accelerator based in Silicon Valley that provides early-stage companies with seed funding, mentorship, and resources over a three-month program held twice a year. Startups receive initial funding in exchange for equity and culminate in a Demo Day where they pitch to investors. Y Combinator has launched successful companies like Airbnb, Dropbox, and Stripe, significantly impacting the startup ecosystem and inspiring numerous other accelerators globally.

- **Datasets**
  - **YC Campanies**

```
df_yc_companies = pd.read_csv('input/datasets/2024 YCombinator All Companies
↪  Dataset/companies.csv')

df_yc_industries = pd.read_csv('input/datasets/2024 YCombinator All Companies
↪  Dataset/industries.csv')
df_yc_tags = pd.read_csv('input/datasets/2024 YCombinator All Companies
↪  Dataset/tags.csv')
# print(df_yc_tags.groupby('id')['tag'].agg(list).reset_index())
df_yc_companies = df_yc_companies.merge(df_yc_industries[['id',
↪  'industry']].groupby('id')['industry'].agg(list).reset_index(), on='id',
↪  how='left')
df_yc_companies =
↪  df_yc_companies.merge(df_yc_tags.groupby('id')['tag'].agg(list).reset_index(),
↪  on='id', how='left')
```

```
df_yc_companies = df_yc_companies[['name', 'slug', 'oneLiner', 'website',
↪  'smallLogoUrl', 'teamSize', 'tag', 'industry', 'batch']].rename(columns={
    'name': 'Company',
    'slug': 'Slug',
    'oneLiner': 'Short Description',
    'website': 'Website',
    'smallLogoUrl': 'Logo',
    'teamSize': 'Team Size',
    'tag': 'Tags',
    'industry': 'Industries',
    'batch': 'Batch'
})
print(df_yc_companies.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4844 entries, 0 to 4843
Data columns (total 9 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   Company            4844 non-null   object
 1   Slug               4841 non-null   object
 2   Short Description  4692 non-null   object
 3   Website            4817 non-null   object
 4   Logo               4197 non-null   object
 5   Team Size          4766 non-null   float64
 6   Tags               4463 non-null   object
 7   Industries         4825 non-null   object
 8   Batch              4844 non-null   object
dtypes: float64(1), object(8)
memory usage: 340.7+ KB
None
```

```
df2_yc_companies = pd.read_json('input/datasets/yc_startups.json')
print(df2_yc_companies.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1000 entries, 0 to 999
Data columns (total 12 columns):
 #   Column       Non-Null Count  Dtype
---  ------       --------------  -----
 0   name         1000 non-null   object
 1   description  1000 non-null   object
 2   location     1000 non-null   object
 3   url          1000 non-null   object
 4   tags         1000 non-null   object
 5   site_url     999 non-null    object
```

```
 6   tag_line     999 non-null    object
 7   long_desc    999 non-null    object
 8   thumbnail    975 non-null    object
 9   founders     999 non-null    object
 10  meta         999 non-null    object
 11  socials      999 non-null    object
dtypes: object(12)
memory usage: 93.9+ KB
None
```

- **YC Founders**

```
df_yc_founders = pd.read_csv('input/datasets/2024 YCombinator All Companies
↪  Dataset/founders.csv')
print(df_yc_founders.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 8465 entries, 0 to 8464
Data columns (total 8 columns):
 #   Column           Non-Null Count  Dtype
---  ------           --------------  -----
 0   first_name       8461 non-null   object
 1   last_name        8456 non-null   object
 2   hnid             8465 non-null   object
 3   avatar_thumb     8465 non-null   object
 4   current_company  7624 non-null   object
 5   current_title    2201 non-null   object
 6   company_slug     8465 non-null   object
 7   top_company      8465 non-null   bool
dtypes: bool(1), object(7)
memory usage: 471.3+ KB
None
```

11.1 How many YC companies are in unicorn status currently?

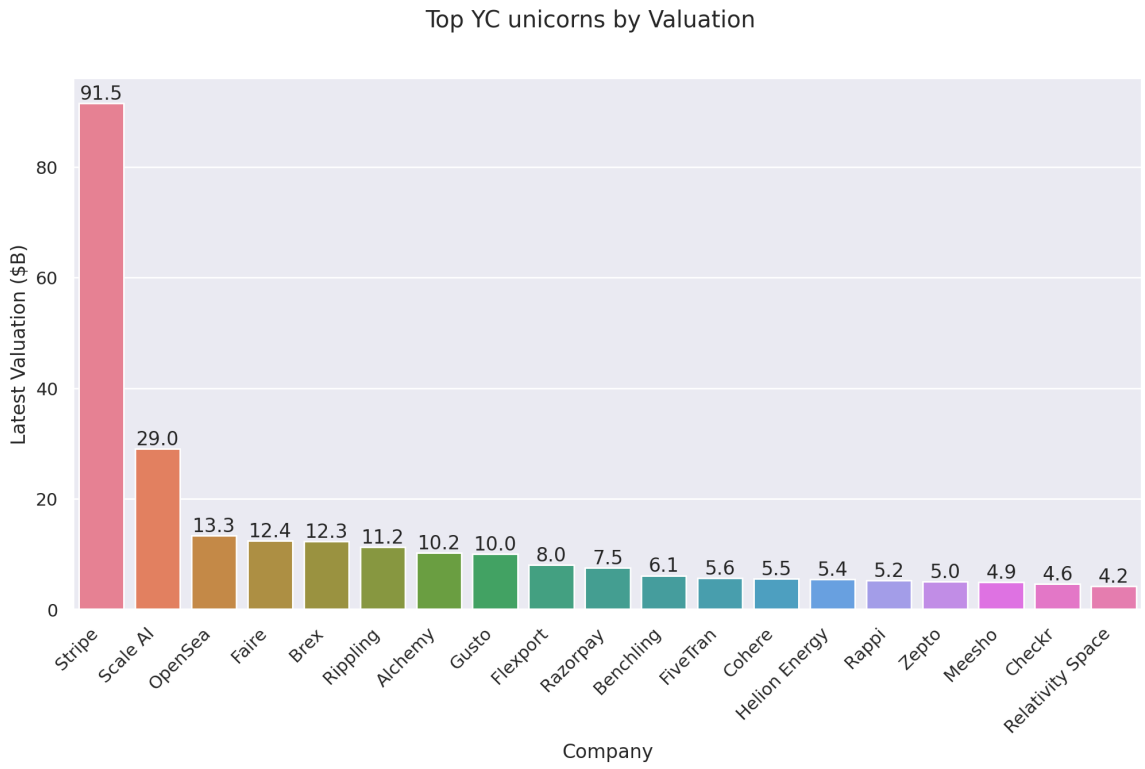
```
df_yc_unicorns = df.assign(tmp_col=df.Company.str.lower()).merge(
    df_yc_companies[['Company', 'Slug', 'Short Description', 'Website', 'Logo', 'Team
    ↪  Size', 'Tags', 'Industries', 'Batch']].assign(tmp_col=lambda x:
    ↪  x.Company.str.lower()),
    on='tmp_col', how='inner').drop(['tmp_col', 'Company_y'],
    ↪  axis=1).rename(columns={'Company_x': 'Company'})
df_yc_unicorns['Batch Season'] = df_yc_unicorns['Batch'].apply(lambda x: 'Summer' if
↪  x[0]=='S' else 'Winter')
df_yc_unicorns['Batch Year'] = pd.to_numeric(df_yc_unicorns['Batch'].apply(lambda x:
↪  f'20{x[1:]}'))
print(df_yc_unicorns.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 98 entries, 0 to 97
Data columns (total 25 columns):
 #   Column                     Non-Null Count  Dtype
---  ------                     --------------  -----
 0   Company                    98 non-null     object
 1   Valuation ($B)             98 non-null     float64
 2   Total Equity Funding ($)   98 non-null     int64
 3   Unicorn Date               98 non-null     datetime64[ns]
 4   Date Founded               98 non-null     int64
 5   Years to Unicorn           98 non-null     object
 6   Industry                   98 non-null     object
 7   Country                    98 non-null     object
 8   City                       98 non-null     object
 9   Select Investors           98 non-null     object
 10  Unicorn Year               98 non-null     int32
 11  Funding ($B)               98 non-null     float64
 12  Funding ($M)               98 non-null     float64
 13  Latest Valuation ($B)      98 non-null     float64
 14  Years to Unicorn (Months)  98 non-null     int64
 15  Slug                       98 non-null     object
 16  Short Description          97 non-null     object
 17  Website                    98 non-null     object
 18  Logo                       95 non-null     object
 19  Team Size                  96 non-null     float64
 20  Tags                       92 non-null     object
 21  Industries                 98 non-null     object
 22  Batch                      98 non-null     object
 23  Batch Season               98 non-null     object
 24  Batch Year                 98 non-null     int64
dtypes: datetime64[ns](1), float64(5), int32(1), int64(4), object(14)
memory usage: 18.9+ KB
None
```

11.2 Top Companies by Valuation

```
df_top_yc_unicorns = df_yc_unicorns.sort_values(by='Latest Valuation ($B)',
↪  ascending=False).head(20)
fig, ax = plt.subplots(figsize=(12,6), dpi=200)
ax = sns.barplot(data=df_top_yc_unicorns, x='Company', y='Latest Valuation ($B)',
↪  hue='Company')
for i in ax.containers:
    ax.bar_label(i, fmt='%.1f')
plt.xticks(rotation=45, ha='right')
plt.suptitle('Top YC unicorns by Valuation')
```

```
plt.show()
```



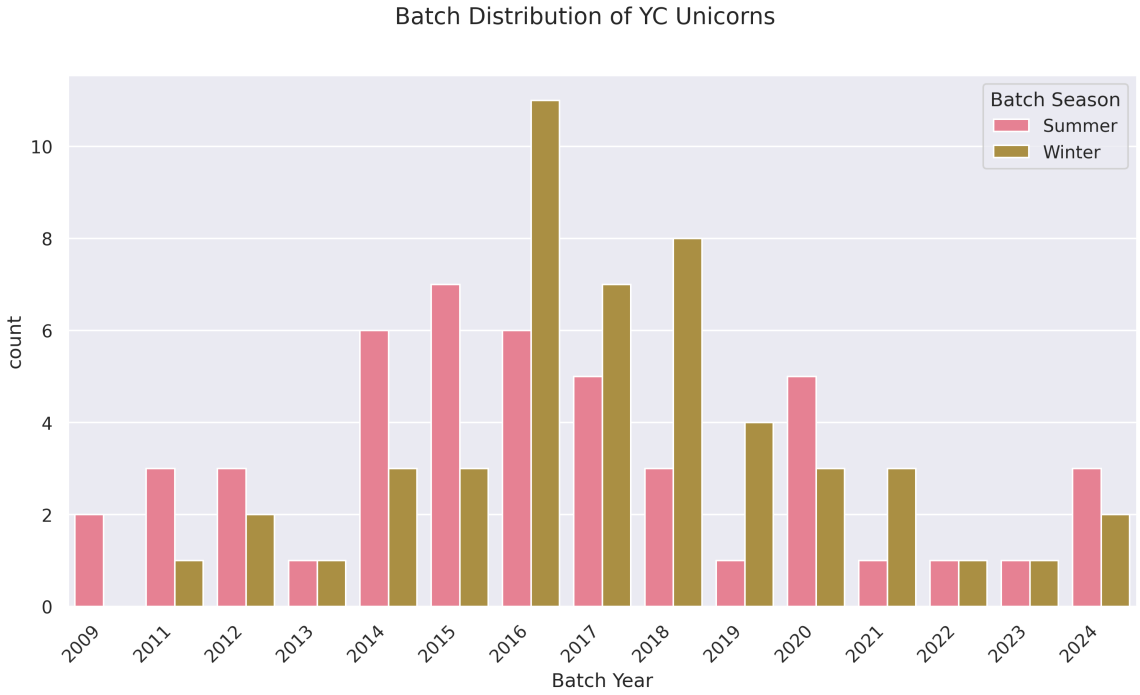
11.3 YC Batch Distribution

```
_df = df_yc_unicorns.groupby(['Batch Year', 'Batch
↪  Season']).size().reset_index(name='count').sort_values(by='Batch Year')
print(_df)
```

	Batch Year	Batch Season	count
0	2009	Summer	2
1	2011	Summer	3
2	2011	Winter	1
3	2012	Summer	3
4	2012	Winter	2
5	2013	Summer	1
6	2013	Winter	1
7	2014	Summer	6
8	2014	Winter	3
9	2015	Summer	7
10	2015	Winter	3
11	2016	Summer	6
12	2016	Winter	11
14	2017	Winter	7

13	2017	Summer	5
15	2018	Summer	3
16	2018	Winter	8
17	2019	Summer	1
18	2019	Winter	4
19	2020	Summer	5
20	2020	Winter	3
21	2021	Summer	1
22	2021	Winter	3
23	2022	Summer	1
24	2022	Winter	1
25	2023	Summer	1
26	2023	Winter	1
27	2024	Summer	3
28	2024	Winter	2

```
plt.subplots(figsize=(12,6),dpi=300)
sns.barplot(_df, x='Batch Year', y='count', hue='Batch Season')
plt.xticks(rotation=45, ha='right')
plt.suptitle('Batch Distribution of YC Unicorns')
plt.show()
```



11.4 Top Countires

```
top_countries = df_yc_unicorns['Country'].value_counts().nlargest(20).index
top_countries
```

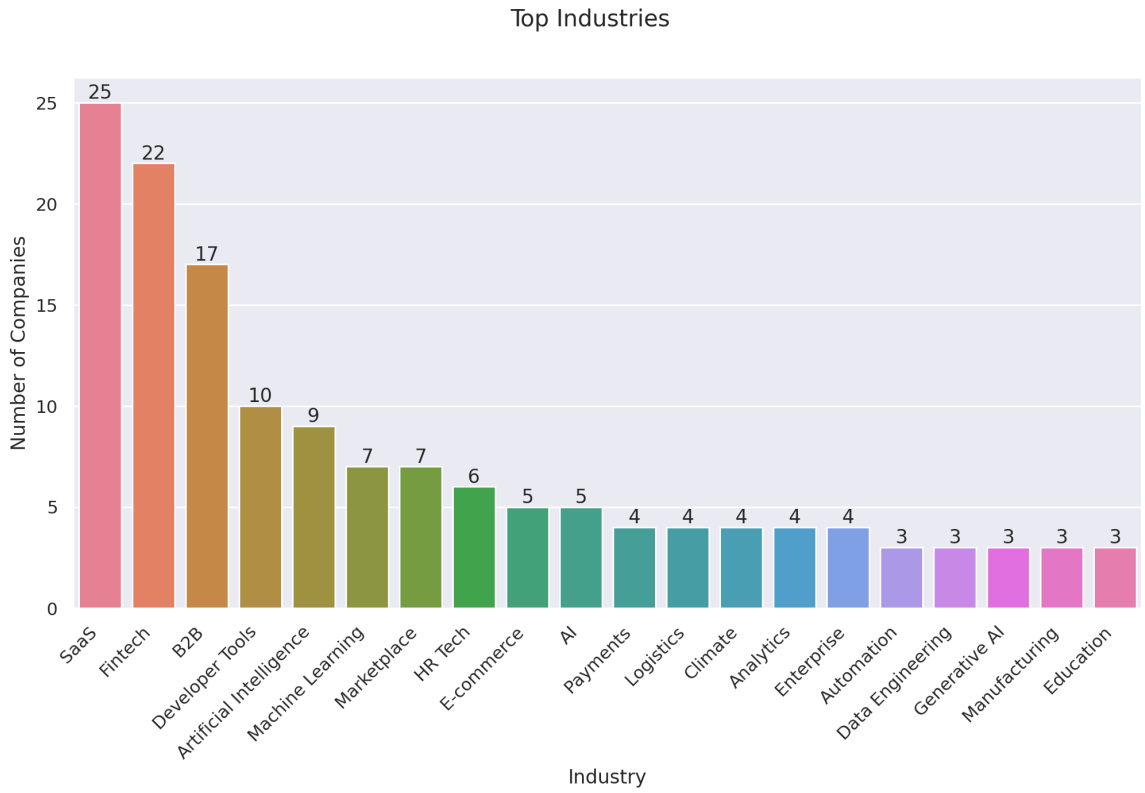
```
Index(['United States', 'India', 'United Kingdom', 'Canada', 'Mexico', 'Indonesia', 'Col
```

11.5 Top Industries

```
top_industries =
↪  df_yc_unicorns['Tags'].explode().value_counts().head(20).reset_index(name='Count')
print(top_industries)
```

	Tags	Count
0	SaaS	25
1	Fintech	22
2	B2B	17
3	Developer Tools	10
4	Artificial Intelligence	9
5	Machine Learning	7
6	Marketplace	7
7	HR Tech	6
8	E-commerce	5
9	AI	5
10	Payments	4
11	Logistics	4
12	Climate	4
13	Analytics	4
14	Enterprise	4
15	Automation	3
16	Data Engineering	3
17	Generative AI	3
18	Manufacturing	3
19	Education	3

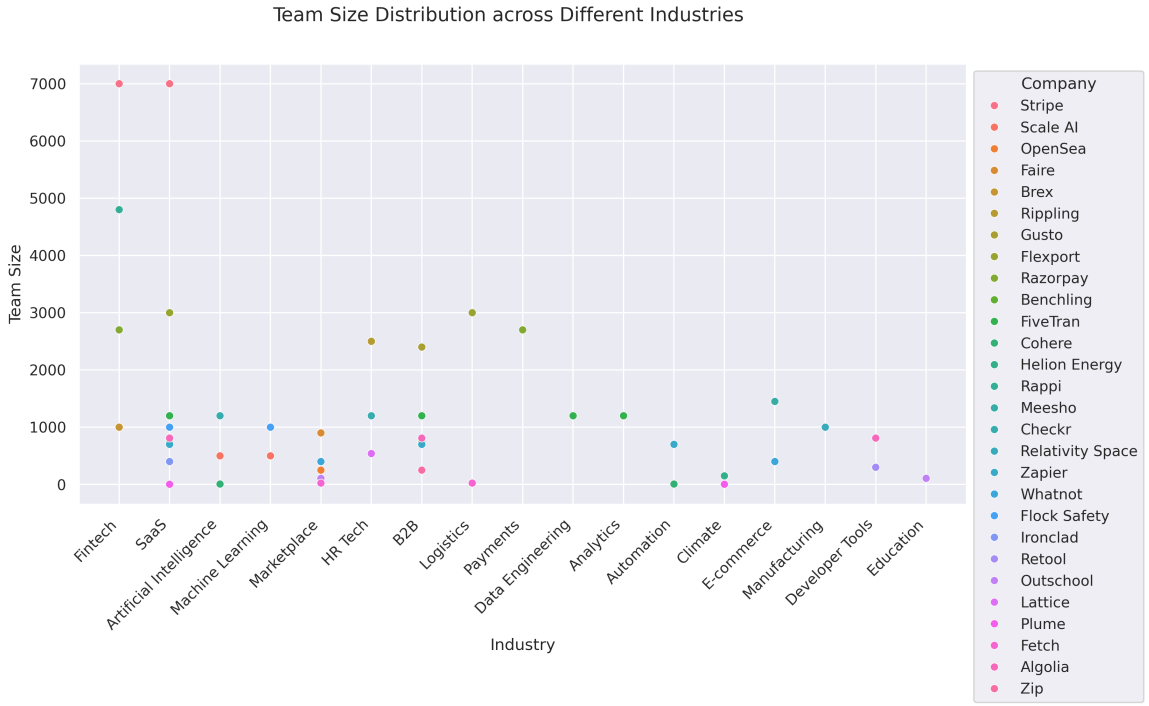
```
plt.subplots(figsize=(12,6), dpi=200)
ax = sns.barplot(data=top_industries, x='Tags', y='Count', hue='Tags')
ax.set(ylabel='Number of Companies',
       xlabel='Industry')
for i in ax.containers:
    ax.bar_label(i)
plt.xticks(rotation=45, ha='right')
plt.suptitle('Top Industries')
plt.show()
```



11.5.1 Team Size Distribution across Different Industries

```
_df = df_yc_unicorns.explode('Tags')
_df = _df[_df['Tags'].isin(top_industries['Tags'])]
_df = _df.dropna().sort_values(by='Latest Valuation ($B)', ascending=False).head(50)

plt.subplots(figsize=(12,6), dpi=300)
ax = sns.scatterplot(_df, x='Tags', y='Team Size', hue='Company')
sns.move_legend(ax, "upper left", bbox_to_anchor=(1, 1))
ax.set(ylabel='Team Size',
       xlabel='Industry')
plt.xticks(rotation=45, ha='right')
plt.suptitle('Team Size Distribution across Different Industries')
plt.show()
```



12 Case Study

12.1 Scale AI

12.2 FTX

12.3 Lalamove

13 References

- Unicorn (finance) [wikipedia]
- The YC Startup Directory